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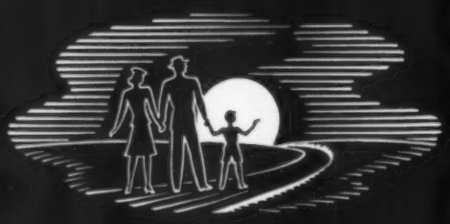

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DEEP in a concrete vault, the Naval Observatory's time machine ticks out a signal broadcast around the world. Our national coordination is keyed to this watchword of accuracy. For the physical coordination we depend on another precision time machine — the aircraft engine — which makes the most of time available. Wright engines, in larger, swifter carriers, are the watchword of progress in time-saving, tonnage air transport.

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COMPACT
POWERFUL

Wright ENGINES

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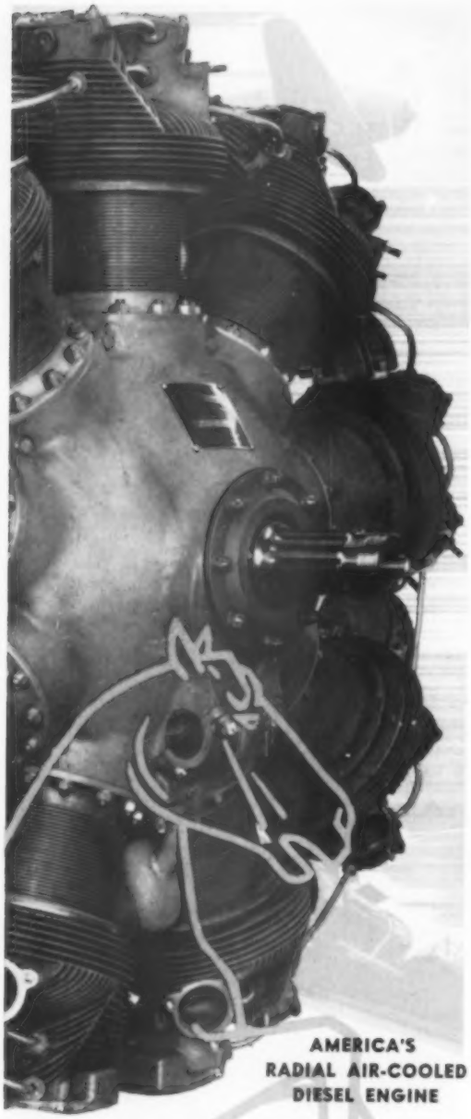

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Southern Flight

The only complete monthly digest of aeronautics in the South and Southwest

JUNE, 1943 VOL. XIX, NO. 6

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IT'S a vital role the Piper HE-1 Ambulance Plane is playing . . . a role that is saving many American lives! Landing in small fields where most planes could not operate, the "Air Ambulance" picks up a casualty and carries him, comfortably enclosed under the plane's hinged turtle deck, to a base hospital. It transports him with speed that often means the difference between life and death.

Built especially for the Navy, it adds another page to the story of services rendered our Armed Forces by Piper Cub planes. The important parts played by this "Air Ambulance" and the famous Piper L-4 "Grasshopper" daily bring victory nearer!

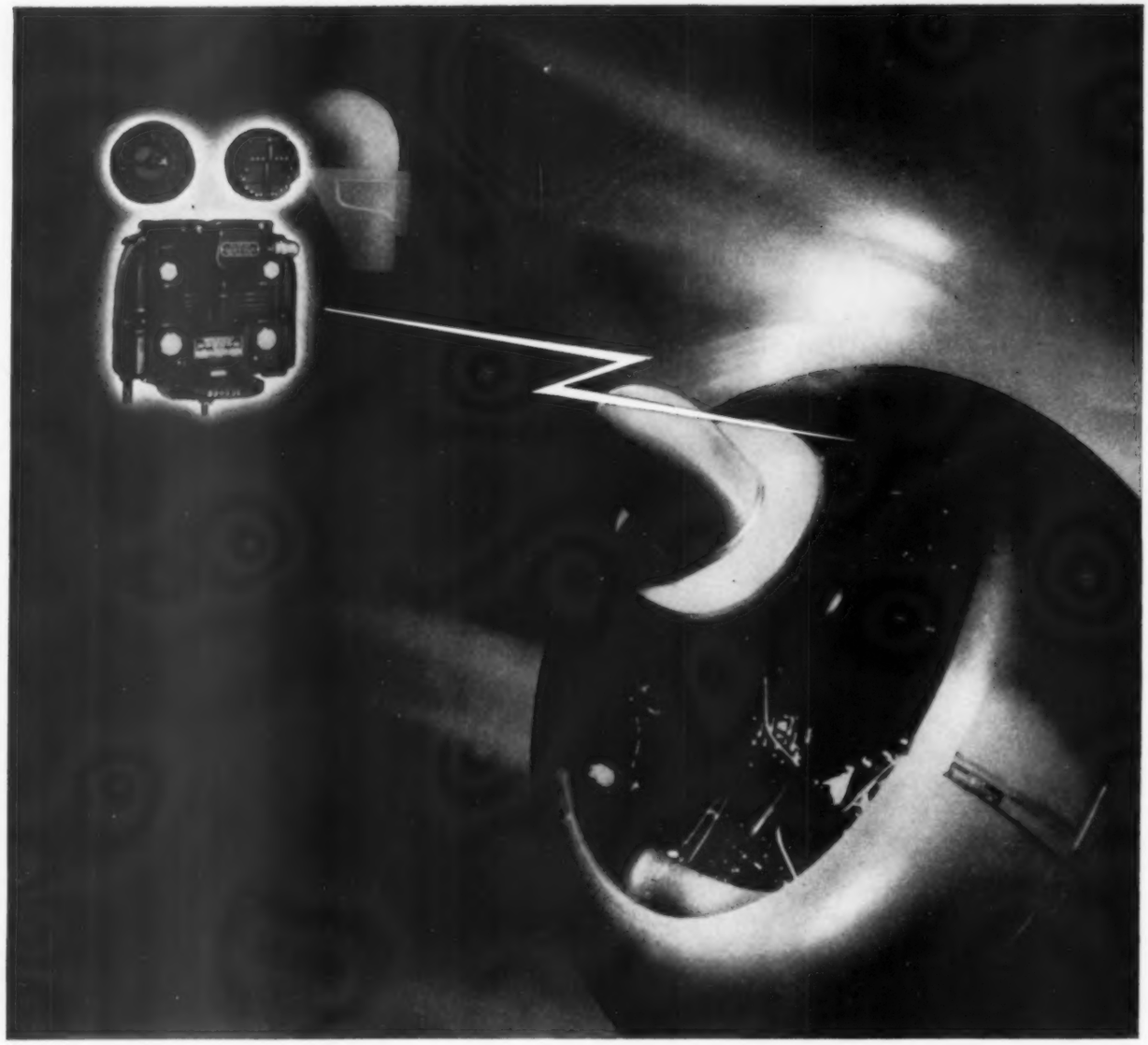
And, when peace comes, the lessons learned and the developments made during this war will combine to bring you a superb peacetime Piper Cub plane. In it, you'll fly to your favorite vacation spots and streamline your business trips. Then small airports and highway landing strips will dot the country. And, light airplanes will dominate the air just as popular-priced automobiles dominate the road!

FREE BOOKLET ON HOW TO FLY. Send today for your copy of the easy-to-understand booklet "You, Too, Can Fly!" If you also want the full-color Piper catalog, enclose 10c in stamps or coin for postage-handling. Piper Aircraft Corporation, Dept. SF63, Lock Haven, Penna.

16mm. SOUND FILM—"The Construction of a Light Airplane" now available. For point of nearest distribution, write the producer: Supervisor, Audio-Visual Aids, Extension Services, Pennsylvania State College, State College, Pennsylvania.

PIPER *Cub*

POINTS THE WAY TO WINGS FOR ALL AMERICANS



Nerve Center of the "Thunderbolt" Engine!

TWO THOUSAND horsepower of stratosphere terror is the famous P-47. And what keeps its super power plant roaring, each of its 18 cylinders firing, timed to the split second, is "BENDIX-SCINTILLA" Aircraft Ignition.

Many a knotty ignition problem has high altitude flight presented. And each, whether in the realm of electricity or electronics, has been solved by Scintilla engineers. That is one reason why the "Thunderbolt," and other American high-altitude aircraft, are speeding faster and climbing ever higher to out-fly and out-fight the Axis.

Today, precision-built "BENDIX-SCINTILLA" Aircraft Magnetos, Harnesses and Switches . . . members of the famed "Invisible Crew" . . . constitute a vital contribution to military aviation. Tomorrow, engineered to the needs of giant skyliners and modest flivver planes, they will prove equally valuable to the progress of peacetime flight.

"BENDIX-SCINTILLA" Aircraft Magnetos, Harnesses and Switches are vital members of "The Invisible Crew"—precision equipment which 25 Bendix plants from coast to coast are speeding to our fighting crews on world battle fronts.

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Precision Equipment by Bendix
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SCINTILLA MAGNETO DIVISION BENDIX SCINTILLA THE WORLD'S FINEST AIRCRAFT IGNITION

LONG RANGE COVER . . .

Pacing our bomber formations over great distances . . . fast enough and powerful enough to smash up any Axis attempt at interception . . . high altitude convoys of long-range *Republic P-47 Thunderbolts*—potent 2,000 h.p. fighters—extend America's striking power.

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AIR MASTERY THROUGH REPUBLIC AVIATION ENGINEERING EXCELLENCE

The Birdmen's Perch

Had a little trouble with Flutter, the Oily Boid...

We'd been down to the Red Cross, and left them a pint of our blood. It was a little watery, but they didn't seem to mind. Afterward, we were telling Flutter that the whole business was easy as pie—and a lot more satisfying. We told him how badly the blood was needed—and next thing we knew, he'd sneaked off to the Red Cross himself!

But of course, they had to tell him that his blood was not the right type ... and that made our fatheaded little falcon *fee-yew-rious!* We were afraid he'd tear Pittsburgh down, brick by brick!

Finally we made an arrangement with the Signal Corps and Flutter quieted down.

Flutter's blood will be used to give transfusions to wounded carrier pigeons!

Major Al Williams,
alias, "Tattered Wing Tips,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

BRAINTWISTER

About to leave on a hunting trip, a man remembered a rule against guns in the cabin of a plane. He also remembered that this particular air line would not carry baggage whose greatest dimension exceeded 1 yard. And even though his rifle measured 1.7 yards, he was clever enough to pack it and take it with him without taking it down or "breaking" it. Can you guess how? If you can't, we'll send you the answer.

SOMETHING HAS BEEN SUBTRACTED

The engines that pull planes through the sky have been tremendously improved since the last war . . . and so have the engines that pull planes *from* the sky—anti-aircraft directors.

In the last war, according to the Army Ordnance Chief, it took an average of 17,000 rounds of ammunition to hit (not necessarily bring down) a plane. But 90-mm. guns on Guadalcanal are knocking planes down from 27,300 feet with an average of 50 shells per plane!

Part of this astonishing increase in efficiency is due to the superiority of the 90-mm. gun. But most of the credit belongs to the more advanced and more sensitive technique of fire-direction.

And within the last few years, there's been a tremendous improvement in lubricants, too. At one time, engine lubricants retained many of the dangerous carbon-formers and sludge-makers which were present in the crudes . . . even the most up-to-date refining methods were unable to eliminate these trouble makers. Then Gulf developed a *supplementary* refining technique—the Alchlor Process—for Gulfpride. This additional step gives Gulfpride its exceptional stamina by removing *more* of those trouble-makers.

So most of the credit for the astonishing efficiency of Gulfpride Motor Oil belongs to this more advanced and more sensitive technique of refining—the Alchlor Process.

GETTING BACK TO ARTILLERY—

We'd like you to know about another petroleum war product: It is the oil used in the recoil cylinders of the big guns. These recoil cylinders, of course, are really nothing but hydraulic shock absorbers.

But what SHOCKS!

Not only must the oil in the recoil cylinders be capable of absorbing the terrific backward energy of the gun when it is fired—it must have the guts to stand up under this abuse indefinitely. And it must remain fluid and ready for this punishment in any weather ... under any conditions . . . at any time. IT DOES!

Gulf Oil Corporation and Gulf Refining Company... makers of

GULF AVIATION PRODUCTS

OIL IS AMMUNITION—USE IT WISELY

"EXPLOSIVE GASES ARE NEARLY ALWAYS PRESENT IN A BATTERY CELL, SO KEEP OPEN FLAMES..
...AWAY AND NEVER MAKE OR BREAK A BATTERY CONNECTION WHEN THE CIRCUIT IS LOADED...
... OR ARCING MAY IGNITE THE GASES—ANOTHER COMMON SENSE TIP IS TO ALWAYS....
...USE THAT GOOD GULF AVIATION GASOLINE!

"That nice Jones boy"

IS SURE RAISING HELL

Remember the Jones boy in your neighborhood?

"A nice kid," the neighbors said. Always reading books about modern miracles like aviation and electronics. Making plans, working to make a place for himself in the better world he saw ahead.

We can give you an authentic report on that nice Jones boy because we built the plane he flies today. This U. S. Army Bell Airacobra was designed on the daring new idea of a single engine fighter with a cannon in the nose. It's a hell-raising plane.

And that's right down Jonesie's alley.

Today in the war torn sky above one of the fighting fronts, he's looking for trouble. And doing a swell job of handling it. He's strafing ground troops, smashing tanks and landing barges, knocking enemy bombers and fighters out of the sky.

That nice Jones boy is sure raising hell...with the Axis!

Peace will bring another era of aviation pioneering. We'll be ready for our assignments with war-perfected techniques for designing, engineering and building the peace planes of the future. © Bell Aircraft Corporation, Buffalo, New York.

Airacobras for victory—

FUTURE PLANES FOR PEACE

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PACEMAKER OF AVIATION PROGRESS

CURTISS *Seagull**

FIRST
Since the Birth of Aviation

Eyes FOR OUR CONVOYS

Scouting the paths of convoys across the limitless miles of submarine-infested seas, U. S. Navy Seagulls and British Seamews are protecting thousands of lives and millions of tons of war supplies.

Behind these modern scout-observation aircraft lie years of development reaching back to that February day in 1911 when Glenn Curtiss successfully landed his pontoon-equipped biplane alongside the U. S. S. Pennsylvania near San Diego—and to November 12, 1912, when the first ship catapult launching of an airplane was made.

CURTISS-WRIGHT
Corporation
AIRPLANE DIVISION
Member: Aircraft War Production Council, East Coast, Inc.

**British designation—Seamew*

01- Command

0. CAP Rules, as prescribed and amended by the National Commander, will govern all personnel with exceptions only as he may prescribe by Orders, by CAP Instructions in separate series to meet temporary or special situations sometimes without regard to CAP Rules, or by CAP Confidential Instructions also in separate series for issuance only to personnel concerned. Informal instructions and interpretations of Rules will be issued in CAP Bulletins. Detailed procedure will be set forth in Manuals prescribed by CAP Rules.

1. The CAP organization consists of a National Headquarters; Wings (one in each of the 48 States) composed of Groups, Squadrons, Flights, and Sections; and certain operations units.

2. CAP operations will be performed by National operations units; Wing operations units; and regular Wing units.

3. The National Commander will establish or disestablish the Wings and National operations units, assign to them their personnel, fix their functions and areas, and appoint or remove their commanders.

4. All CAP personnel (10-0) will be subject to orders of the National Commander and the commanders of the units to which they are assigned.

5. The composition of a CAP unit will be determined by the number of active CAP members assigned to it by the commander of the next higher unit.

6. Each unit commander will be responsible for all activities under his command, the execution of orders from higher commands, and the proper assignment of personnel assigned to his command. Subject to the approval of the next higher commander, he may:

1 Appoint or remove the assistant and staff officers prescribed for his unit whom he may authorize to issue orders by his order.

2 Establish or disestablish subordinate units authorized by CAP Rules and reporting directly to his command, combine them with other units in his command, fix their areas, and appoint or remove their commanders.

7. A unit will be on a provisional status until designated by the National Commander. The unit headquarters will be fixed on designation and will not be changed without approval of the next higher unit commander. Changes in unit headquarters and commanders will be reported immediately to National Headquarters through channels.

8. The CAP chain of command runs directly from the National Commander to the commander of each Wing or operations unit; thence directly to the commander of the next subordinate unit; and so on to the officer in direct charge of personnel. Regular channels for orders and communications will be strictly along this chain of command with exceptions only as prescribed by CAP Rules. Forms for orders, requests, and reports will be prescribed by the National Commander and identified by applicable CAP Rule numbers.

10-a

WASHINGTON, MARCH 29, 1943

SUBJECT: CAP RULES

To: All CAP Unit Commanders

1. Attached is the beginning of a codification of the CAP directives into a new series to be known as the CAP Rules, indexed for ready reference.

2. The Part on Organization embodies few changes. Rules as to the composition of units are more explicit than heretofore and will be followed in the organization of all new units. For existing units these provisions will be optional for the present but will be made effective later in the year. Meanwhile, Wing Commanders will take the necessary steps to bring their organizations into compliance with the Rules with a minimum of dislocations.

3. Note especially Titles 06 and 07 which provide for dividing Flights into Sections, including Sections for special duties such as radio, photography, parachutes, etc. This makes it possible to use the Flight as an administrative unit for roll call, drill, and training and at the same time, puts specialists together in units which can be detached for the special duties assigned. It has the important effect of giving specific duties to non-commissioned officers.

4. Title 09 does away with the old numbering system for CAP units which was based on Regional Commands which no longer exist. Wings will go by their State names and local units by place names or numbers according to local preference.

5. The beginning of the Part on Personnel provides that an applicant for membership in CAP must serve in a local unit as a provisional member and complete 25 hours of CAP training before his identification card will be issued. Details of procedure will be set forth in the remainder of this Part which soon will reach you. A new system for rating members according to their training, service, and aeronautical experience also will be incorporated.

6. The beginning of Part 3 on Training sets general policies and outlines a broadened training program for which further Rules will be issued soon.

7. The following CAP directives are obsolete and may be removed from files: All Training Memoranda (TM-1 through 14); Training Directives No. 1, 9, 10, and 11; General Orders No. 1 and No. 2; General Memoranda No. 1 through 18, 28, 29, 34, 36, 38, 39, 40, 46, 46a, 51, 69.

EARLE L. JOHNSON,
National Commander.

CAP RULES

CAP Rules are divided into 10 Parts:

0	Organization	5	Equipment
1	Personnel	6	Supply
2	Intelligence	7	Finance
3	Training	8	Miscellaneous
4	Operations	9	Cadets

Each Part may be further divided into 10 Titles by the addition of a second digit. For example, 32 covers Military Training. The first digit (3) denotes the main topic, Training, and the second digit denotes the type of training in this case.

The Titles are further divided into Subtitles which are numbered consecutively, with a dash after the section number. Thus 32-1 is the Subtitle on Military Courtesy and Discipline.

Paragraphs in Subtitles are numbered consecutively, with a period after the Subtitle number. Thus 32-11.2 is a paragraph in the Subtitle on Firearms.

References to Rules are made in the following form: CAP Rules 11-1, 14, 09-1.3, etc., or simply by numbers in parentheses, e.g., (30-1).

Each page of the CAP Rules will be dated. Pages supplementing or superseding those of earlier date will be issued from time to time and pages superseded will be discarded.

Nothing in the CAP Rules is restricted or confidential. Full-text copies will be available in all CAP headquarters for the information of all members or the general public. All CAP members will study the CAP Rules from time to time; will learn their general provisions; and will keep current on amendments.

0- Organization

00- Authority

0. Civil Air Patrol, hereinafter referred to as CAP, originated through the desire of civil airmen of the United States to be utilized, with their equipment, in the war effort.

1. CAP was established December 1, 1941, by the U. S. Director of Civilian Defense by order which reads in part as follows: ". . . in line with the traditions of this nation, ... I do hereby order established under the Office of Civilian Defense, the Civil Air Patrol. . . . I call upon all persons in civil aviation to enroll and otherwise assist in this important contribution to our national defense."

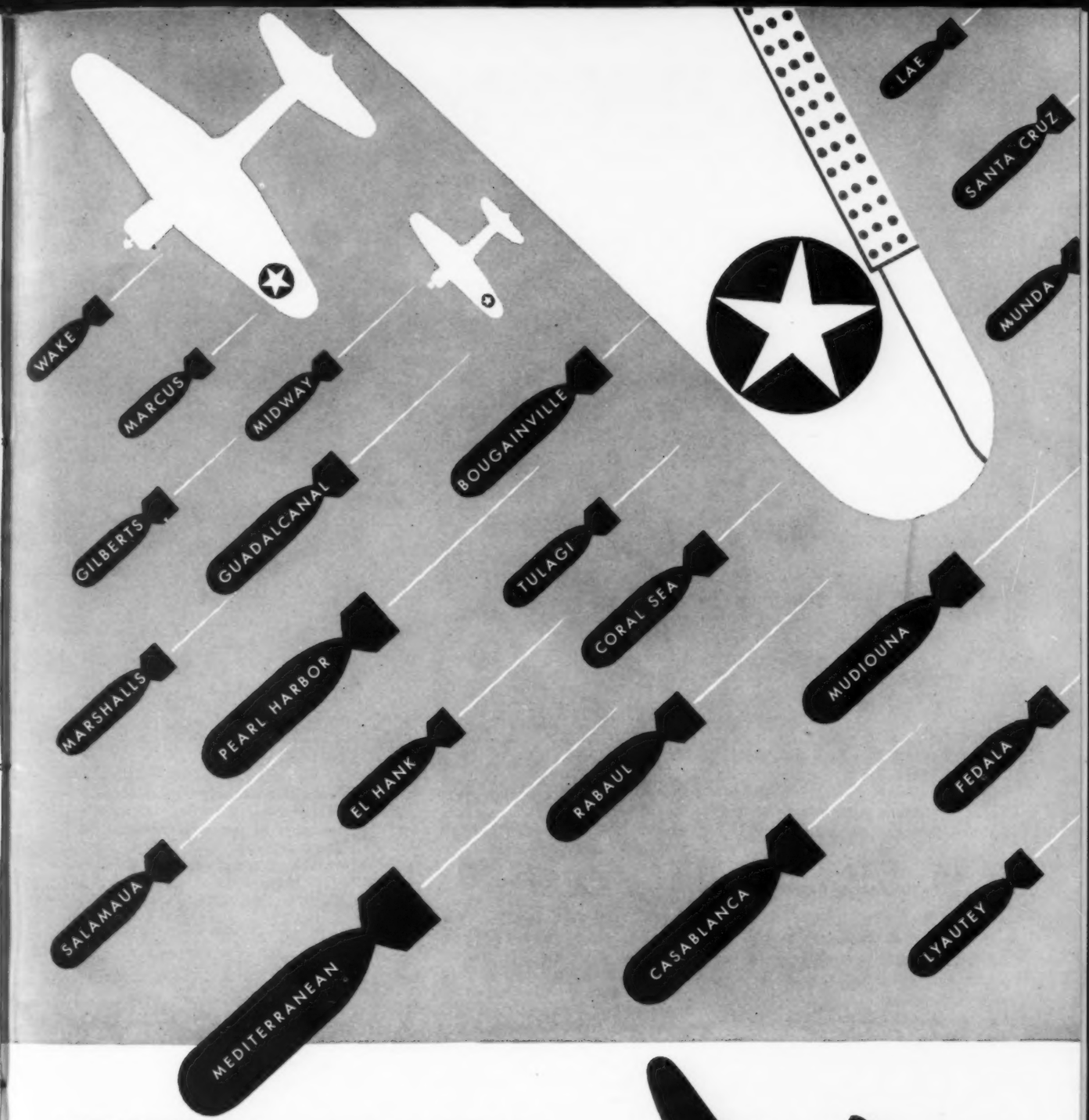
1 This step was taken after consultation with and written approval of the Departments of War, Navy, and Commerce in October, 1941.

2 The establishment of CAP was formalized on December 8, 1941, by OCD Administrative Order No. 9 which reads in part as follows: "By virtue of the authority vested in me through my appointment as United States Director of the Office of Civilian Defense, through the Executive Order (No. 8757) of the President creating said Office, dated May 20, 1941, I have caused to be created and organized a branch of this Office of volunteers for the purpose of enlisting and training personnel to aid in the national defense of the United States, designated as the Civil Air Patrol. . . . It shall be the duty and responsibility of the National Commander to see that the objects and purposes and orders issued in conformity with the policy of the Office are carried out . . . "

3 The status of CAP was confirmed, pursuant to the President's Executive Order No. 9134 of April 15, 1942, redefining the functions of OCD, in OCD Administrative Order No. 23, April 29, 1942, as an organization "composed of volunteer members engaged in civilian air activities, including the performance of such missions as shall be requested by the United States Army or Navy or other departments or agencies of the United States Government, such as observation and patrol flying, courier service, ferrying service, forest patrol, and other types of activity. . . . "

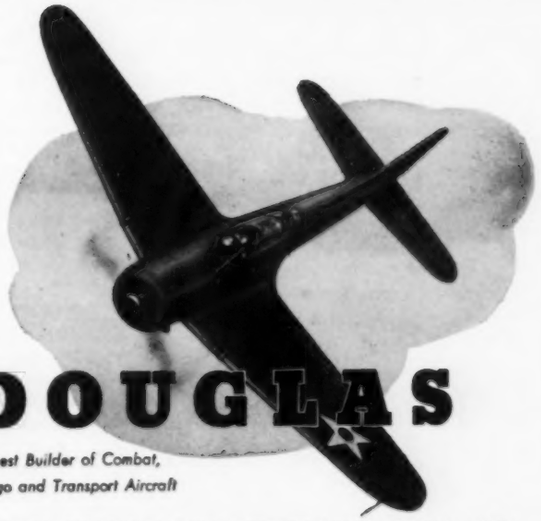
4 On May 1, 1943, the President signed an executive order transferring the Civil Air Patrol to the War Department from the Office of Civilian Defense. The transfer provides that the Civil Air Patrol shall be an auxiliary of the U. S. Army Air Forces.

10-b



DAUNTLESS . . . Again and Again!

HAVING BORNE the brunt of the fighting in the Pacific, Douglas Dauntless Dive Bombers have now blasted the Axis out of Africa. A Rear Admiral of the U. S. Navy says: *"Your entire organization has reason to be proud of the performance of SB-Ds (Dauntless) which have alone sunk more combatant tonnage than all other arms."* DOUGLAS AIRCRAFT COMPANY, Inc., Santa Monica, Calif., Long Beach, El Segundo, Tulsa, Oklahoma City, Chicago.



DOUGLAS

Largest Builder of Combat, Cargo and Transport Aircraft

MEMBER, AIRCRAFT WAR PRODUCTION COUNCIL, INC.

JUST AMONG OURSELVES ★ *Editorials and Comment*

FRANK MAXWELL ANDREWS

Those who knew him and who recognized his greatness feel more than grief over the loss of Lieutenant General Frank Maxwell Andrews, commanding general of U. S. forces in the European theatre, whose plane crashed on an Iceland hillside. His passing was the greatest loss yet suffered in the war by America, for it will be difficult to replace his brilliance in the strategy of air power. It may well be that General Andrews' tragic death has already slowed the time table for the European invasion.

Little can be added to the praise this magazine has already spoken for the man it considered the leading air general of our times. He was of Billy Mitchell's stature.

Golden Opportunity

Now that the helicopter is favored for convoy duty—tankers are being fitted with small landing decks for the experiment—and other forms of submarine spotting, where will the rotary wing pilots come from? We suggest the Civil Air Patrol as the most practical source. CAP pilots and observers have logged thousands of hours and millions of miles over the water. Now that their privately-owned planes are wearing out and cannot be replaced, why not turn that part of the helicopter program assigned to anti-submarine work over to the Flying Minute Men? They're the vanguard of America's postwar army of private flyers, by whom the helicopter will ultimately receive its greatest test.

Experience Counts

When the lid was lifted from radar and the Norden bombsight, it was explained the enemy already knew the secret and even had similar devices, as well as captured or salvaged samples. But we haven't noted any effective employment of them by the foe. Flying Fortresses and Liberators still reach their targets without undue losses, U. S. Navy raiders still surprise Jap islands, and enemy bombardiers still haven't demonstrated pickle-barrel marksmanship. There'll never be a substitute for "know how."

The ATC Delivers

One of the most impressive facts to come from the war is Maj. Gen. Harold L. George's statement that during last February, the Air Transport Command's plane losses en route to combat zones amounted to only four-hundredths of 1 per cent of the planes flown. This was the ATC's busiest month to date.

Tunisia Lesson

No 1 factor in the Tunisian victory was aviation—strafers and low-level bombers. Artillery accuracy was No. 2. Without these, tanks counted for little. Never before, not even in Poland or France, had attack aviation proved so effective. Our prediction: Tank warfare will fade away, at least in the European theater.

AIR PICK-UPS: Important developments may follow successful tests in which a fifteen-place Army cargo glider was flown with improvised power furnished by two lightplane air-cooled engines, one under each wing. Col. Fred Dent, head of the Army's experimental glider program, made the flight. . . . A Flying Fortress crew was credited recently with bringing home a B-17 with two engines on one side dead. . . . And down in New Orleans they are still telling about a Navy training plane landing by itself after its pilot bailed out. Later it was returned to operation, with the same pilot assigned to it.

★ ★ ★

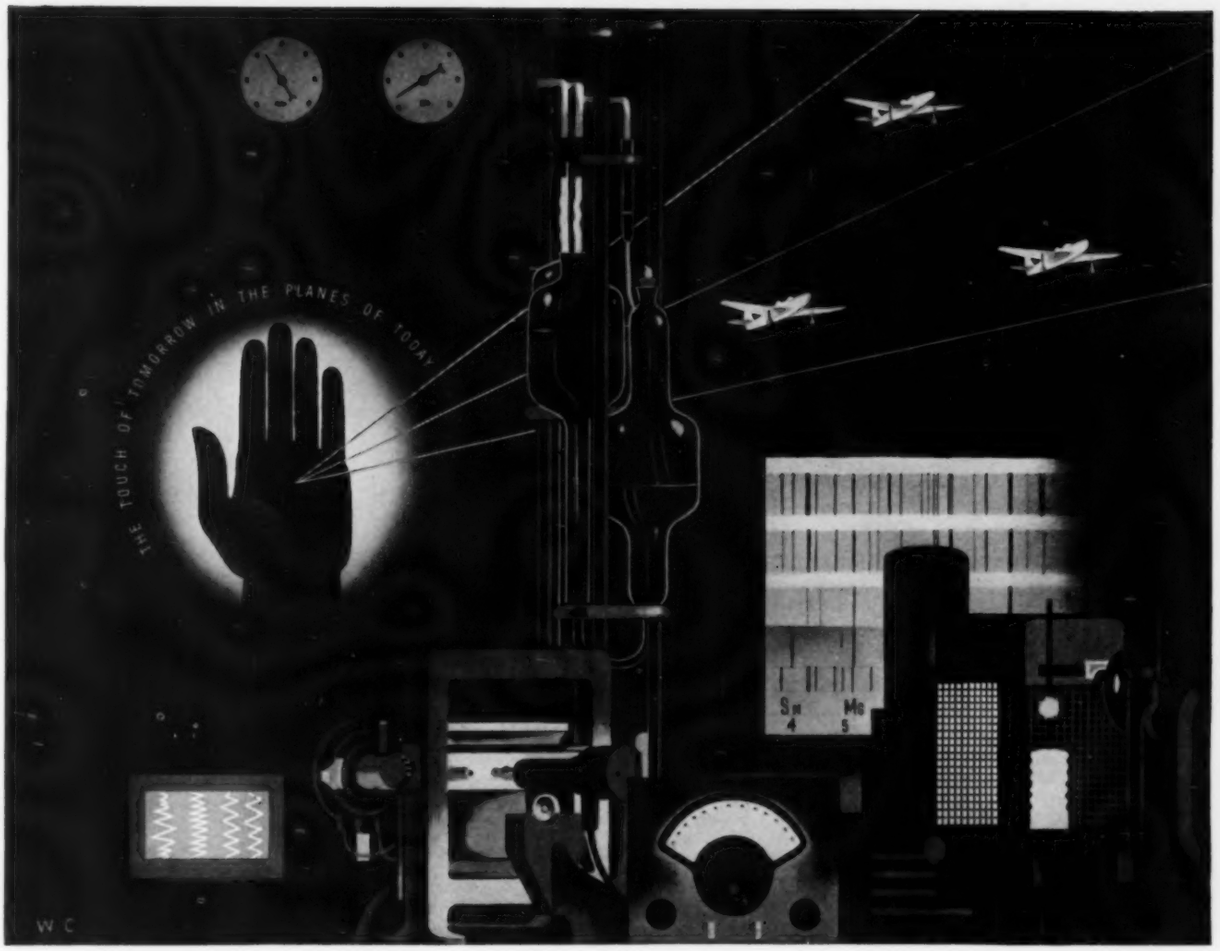
PAYLOADS THAT PAY: Air transport has proved to be more than a quick means of communications in South America. Often it is the only PRACTICAL transport available. Since most of the air tonnage moves over small distances, the South American transport is more of a free-wheeling elevator than anything else. It can carry excessive payloads and minimum fuel supplies, for the busiest planes are those which lift supplies from sea level over great mountain ranges or impenetrable jungles, or vice versa. Therefore payloads really pay, and often it is actually more economical to ship by air than by boat, truck or oxen. Railroads aren't really competition — they never existed in many South American areas, and never will. Miles are meaningless; time is the thing. A graphic illustration of the airplane's meaning is this table comparing the time factor in air and overland travel, as compiled by Lyn Smith and Manuel de J. Manduley in THE INTER-AMERICAN:

	Flying Time	Overland Time
Barranquilla-Bogota	2 hrs., 50 mins.	6 days plus
Guayaquil-Loja	1½ hrs.	6 days plus
Lima-Iquitos	6 hrs.	1 month
Cuzco-Puerto Maldonado	1½ hrs.	3 weeks plus
La Paz-San Borja	1 hr.	3 weeks plus
Cochabamba-Trinidad (Bol.)	1½ hrs.	3 weeks plus
Santa Cruz-Puerto Suarez	2 hrs.	Practically impossible.
Belem-Manaos	8 hrs., 20 mins.	10 days

★ ★ ★

LOOKING AHEAD: Consolidated Vultee's president, Harry Woodhead, has proposed an international aerial police force to insure peace. It would have permanent bases around the globe, adequately manned and equipped for immediate action. Its strength would be 30,000 airplanes, including liaison put-putts and giant bombers, the average life of which would be five years —every year the force would need 6,000 new airplanes. Uncle Sam would participate in the plan, but we also would have a combat air force of our own. "It would be quite large," says

(Continued on page 26)



Organizing Atoms for a Better Aircraft Engine

A visitor at the Ranger plant once remarked: "Scratch a Ranger engineer and you'll find a scientist!" In creating the Ranger in-line, air-cooled aircraft engine, Ranger engineers began by concerning themselves with the very atoms of which its metal alloys are composed. They made use of scientific instruments and techniques unexcelled anywhere in the world in scope and precision. And the same advanced metallurgical and chemical laboratory facilities are today guarding the quality of Ranger materials in the rush of war-time production. Spectroscopic, chemical and X-ray analyses of materials and finished parts are as much a part of Ranger production as milling machines, turret lathes and grinders.

All Ranger engines are put through the acid test of actual operating conditions in scientifically equipped test cells. Ranger's experimental test cells can simulate flying conditions in temperatures as low as —70° F. and at altitudes up to 40,000 feet. Some of Ranger's tests on auxiliary devices are not duplicated anywhere in the aviation industry. In Ranger's "flying laboratory"— a tactical war plane fully equipped with scientific test instruments—pilots and engineers daily add new knowledge to all that has been discovered before.

While thousands of Ranger engines are turning in a remarkable record in the planes of the United Nations, Ranger engineers persist in researches which will make even more readable news tomorrow . . . except in Axis newspapers.

"ON THE BEAM"

"The independence and liberty you possess are the work of joint councils and joint efforts, of common dangers, sufferings and successes."

—Geo. Washington's Farewell Address

Buy U. S. War Bonds and Stamps

RANGER AIRCRAFT ENGINES

Division of Fairchild Engine and Airplane Corporation · Farmingdale, Long Island

To the family that can't take a VACATION TRIP this year

1 *You Can Dream, Can't You . . .* about the good old days before travel was taboo? But even that's a waste of time right now with a war to be won. Here's one way, however, that you *can* enjoy all the fun of the finest vacation . . . and still do something for the war effort.

2 *What a Grand Vacation* you can have on a farm. Lots of fresh air, sunshine, and good food. And when you help a farmer you help to win the war. There are sure to be some farms within easy A card distance. Just call the Farm Labor Dept. of the U.S. Employment Service.

3 *Dreams Do Come True.* And this is one of them. It's the age-old dream of magic trips to everywhere.

It's a dream of vacations every week end instead of once a year, of trips as far as from Louisville to Florida in an easy afternoon's cruise.

How? In your Cessna Family Car of the Air, of course. It's the postwar airplane that you'll be able to *buy and fly* if you can *buy and drive* an automobile. And it's only *postwar* because we're on a 24-hour a day schedule right now building twin-engined Cessna Bobcats for the U. S. Army Air Force.

But when that job is done and peace is here again, remember . . . this dream of *flying-for-the-millions*, is coming true for all of us.

COPR. 1943, CESSNA AIRCRAFT CO.

Cessna

Priority Delivery by Buying War Bonds Now...
Be one of the first to own a Cessna Family Car of the Air after the war. Orders are bound to exceed production. But you can get a preferred listing for early postwar delivery. No obligation to buy. Costs you nothing. Write us today for the simple priority plan. CESSNA AIRCRAFT COMPANY, Box 1616-SF, Wichita, Kansas.

ARMY E NAVY
Cessna

SYMBOL OF AIRCRAFTSMANSHIP FOR THIRTY-TWO YEARS

OVER A MILLION MILES A DAY...

with

JACOBS AIRCRAFT Engines

Each day the future Bomber Pilots of the United Nations are flying Jacobs-powered twin-engine Trainers more than 1,000,000 miles, from United States and Canadian training fields, acquiring the skill and precision that will devastate the factories and ship-yards, the railroads and power lines of the Axis—and that soon will blast the way for our Armies to Berlin and Tokyo.

Day-in and day-out these sturdy engines are ready to go—from dawn to dusk and into the night—on their essential mission of qualifying the Bomber Pilots for their job of freeing the World from the ruthless selfishness of Hitler and Tojo.

When this job has been accomplished, these sturdy engines will carry millions of free people safely and economically on missions of commerce, of mercy and of pleasure.

JACOBS AIRCRAFT ENGINE CO.
POTTSTOWN • PENNSYLVANIA • U • S • A •

Practice bombing such as this, with civilians using a trim Howard, is a great value. It has enabled Civil Air Patrol pilots to sink numerous enemy submarines on coastal patrol.

A Postwar Civil Air Patrol

By BILL GREEN

Drawings by Charles Hubbell

Private flying's greatest possibilities for expansion exist in the Civil Air Patrol. A keenly-interested observer sees great things coming, but recommends careful planning to perpetuate the organization with effective training and practical equipment.

AFTER slightly more than eighteen months of the U. S. participation in the war there is still some civilian flying, other than that done by the Civil Air Patrol. It's true, there isn't much; the WTS has taken a great number of our planes—and has eyes on a lot more. However, most of our airports are still open. A lot of new ones have started up. There isn't much trading of airplanes in the civilian market. However, there is still a possibility of trading, if one has a plane the CAA doesn't want—and there are quite a few such.

The CAP has continued to expand its far-flung operations. Many thousands of miles of courier service augment the airlines and other transportation agencies. There are pipeline, forest and levee patrols in constant operation. There are several thousand miles of coastal and border patrols. Almost every pilot and airplane and many observers may participate in this work, either full or part-time. It is likely the services will continue to expand, as the Army has recently taken over the CAP and seems to believe the various services essential and helpful. There can be no doubt the many airplanes and pilots of CAP have done yeoman work in relieving regular Army planes and pilots for combat duty.

The picture is going to be different after the war. Many old operators who were our friends have been completely dislocated. They have moved—many have expanded operations. Many airports have changed hands. The Army operates a lot of them and they are not open to the public any longer. Airplanes are becoming scarce. Parts are almost impossible to obtain. We expect a lot of airplanes, like automobiles, to break down—they may not be repaired due to inability to obtain parts.

We believe the CAP will be bigger and stronger after this war. There has never been an organization of its kind and size before. It is probable it will end the war with more than 150,000 members—if continued under proper guidance, it might grow to number a million or more persons.

Such a group might, if things were planned properly, be given many peacetime jobs — forest and pipeline patrols, anti-smuggler patrols along our borders, and as an auxiliary to the Coast Guard in protecting our coasts and yachtsmen and fishermen. We can visualize this group as maintaining its many coastal patrol and border patrol bases and being paid by the government for some regular peacetime services.

We think after the war there will undoubtedly be some sort of compulsory military service for every one. Those people with military experience would not be required to serve the original one or two years — but would be required to take refresher courses for a couple of weeks each year. These courses or camps could be held—for the CAP—on the various CAP bases, and the Army could provide adequate instructors. We believe it could be so worked out that CAP service could be counted as Army service, with the especial attraction to the Army, that CAP personnel would be ready to provide its own equipment in the event of emergency.

Visualize a Civil Air Patrol, after the war, that would contain a million persons interested in flying. That million persons would own at least one hundred thousand airplanes. If the Army would designate each couple of years a series of types of aircraft available on the market as "standard CAP models" then it is likely that most of those one hundred thousand aircraft would fall in two or three categories. If the "standard CAP models" would have proper arrangements made, they would come equipped with machine gun mountings and gearings, and with fixtures to which bomb racks could be easily attached—for practice (during

Piper Cubs have saved many lives and much property damage by recent Civil Air Patrol operations through the Midwest flood territory. Floods will ravage the countryside in peace — such training as this will always pay dividends.

each year's two weeks camp) or for war service.

At any rate, if you let your imagination go, in ten years time we would have a well-trained and well-equipped air army, ready for any sort of auxiliary military service—with lots of new equipment—at no considerable cost to the government. The Army and Navy have found this a great help during this emergency. If planned in advance, it would be worth ten times as much during the next emergency.

We hope the world will learn some lessons from this war. This war proves wars to end all wars are not successful. We'll bet that there will be other wars after this one. No matter what we do—there are enough grasping and chiseling people who have no intention of competing honestly and peaceably with the rest of the world, to start another war—no matter what the safeguards. Of course, we can do something to stave it off—or to reduce the number and size of the wars—but the only real safety we can see is for us to be ready for any eventuality. Let's be prepared and ready. That way there may not be any necessity for us to fight.

This is the first time the Army and Navy have called upon the whole people of this country for more than manpower and money. In this war they have utilized all sorts of equipment and facilities, too. They have utilized thousands of private airplanes. They have utilized thousands of radio transmitters purchased from amateur enthusiasts. They have purchased practically all the stocks of radio parts and equipment commonly used only by the amateurs.

The utilization of much of this equipment has resulted in the discovery that there have been so many divergent types and styles of equipment that the repair and maintenance problems have been almost insurmountable.

We hope when manufacture of such items is resumed, after the war, that we can get together in the radio and aircraft industries, and have some sort of standardization group similar to the Society of Automotive Engineers, and the American Petroleum Institute who have been so instrumental in standardizing the various engineering practices in the automotive and aircraft and oil industries. If such a standardization could be worked out, perhaps the next war would find us with a lot more radio and aircraft equipment—already in the hands of the public—of similar enough characteristics as to permit easier operation and maintenance, and smaller stockpiles of parts and repairs.

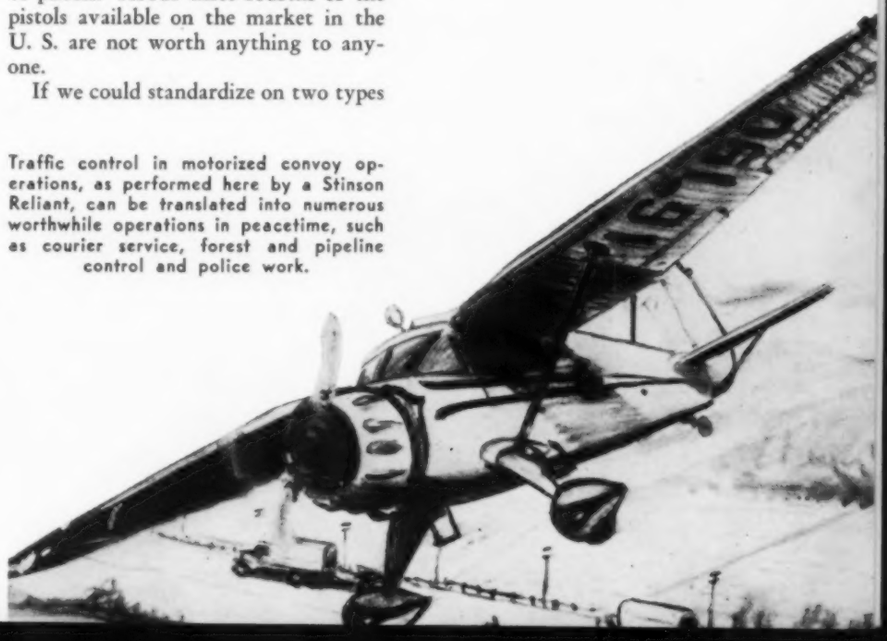
This idea can be applied to radio—there are too many sizes, types and kinds of radio equipment.

There are too many sizes and types of pistols. About three-fourths of the pistols available on the market in the U. S. are not worth anything to anyone.

If we could standardize on two types —say a .38 revolver like Smith and Wesson or Colt, and .45 automatic like the present Colt—that would be enough. Then there would be plenty of ammunition on hand. Of course, we should keep the .22 sizes for practice purposes.

If you want to consider it, such standardization has worked out in a lot of places. The pick-up truck, the one and one-half ton truck and the station wagon are standard and there is little variation in the models made by different companies.

Of course, we know that it is the good old American Idea that no person's ideas and efforts shall be suppressed. If a man wants to devise a new model of radio, which in most cases just means a different layout of parts, then he shall be permitted to do so—even if the thing is no good, or represents no net gain to the public. However, certain styles or types *could* be designated as standard for certain kinds of service. That would help a lot.



Traffic control in motorized convoy operations, as performed here by a Stinson Reliant, can be translated into numerous worthwhile operations in peacetime, such as courier service, forest and pipeline control and police work.

WE'RE still working as we have always worked to the highest precision standards. E.L.I. at war is building vital aviation and other military equipment to help the United Nations achieve Victory . . . adapting the precision workmanship that established E.L.I. instruments and services in World-Wide use . . . to the requirements of quantity production, that forecast many improvements and new E.L.I. Products for a brighter tomorrow.

Engineering Laboratories, Inc.

CONSULTING ENGINEERS & MANUFACTURERS

TULSA, OKLAHOMA U. S. A.

EQUIPMENT IN WORLD-WIDE USE

Outward Bound!

A "Dauntless" takes off on AEROLS*

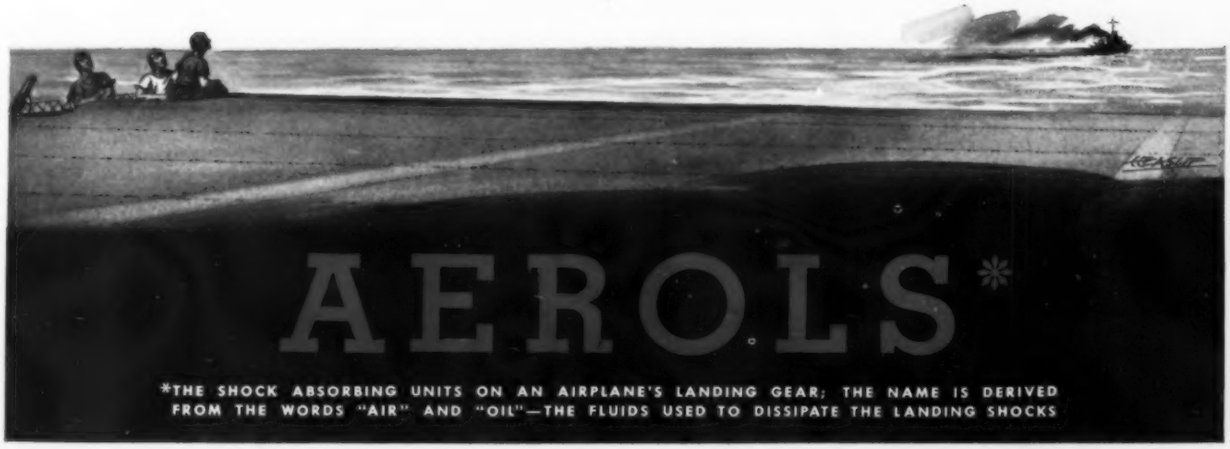
Nemesis of the Nipponese navy, the Douglas "Dauntless" is the world's hardest hitting dive bomber.

Because this outstanding plane is equipped with Aerols, it performs with effortless ease the exacting job of taking off or landing on an aircraft carrier.

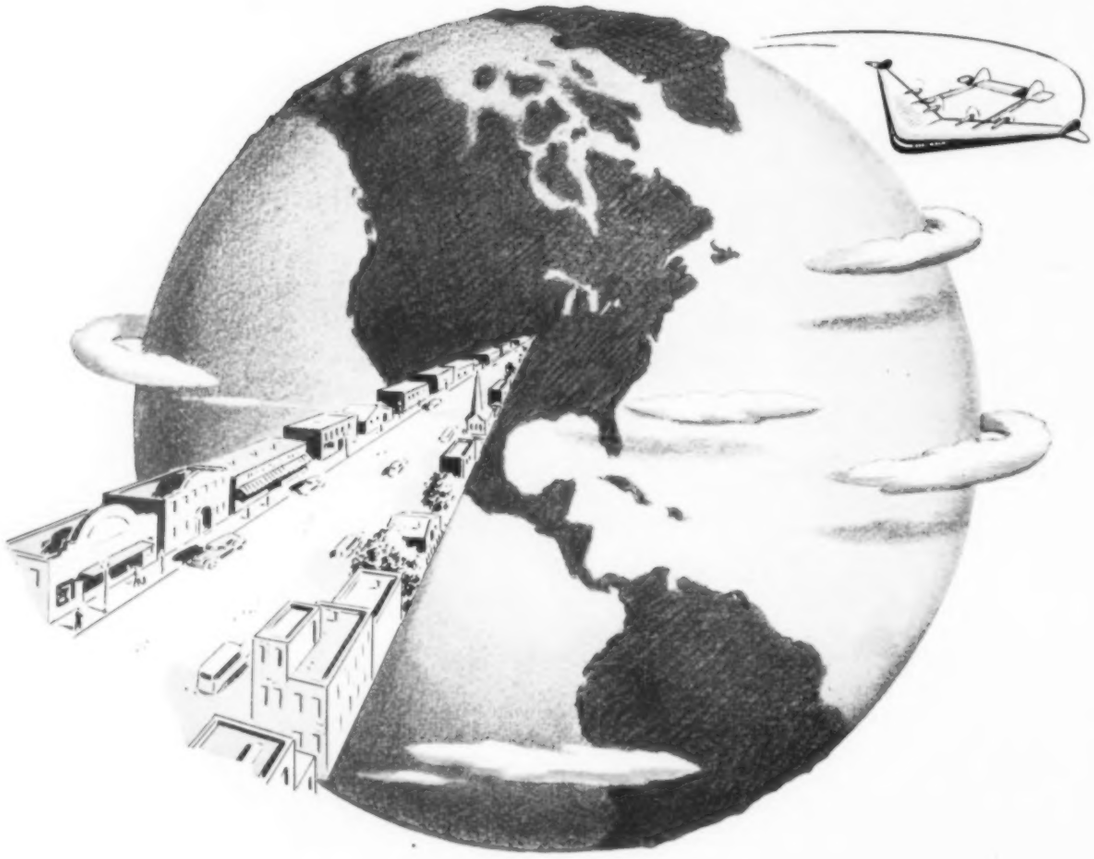
The "Dauntless" is only one of many planes that are equipped with Aerols. For Aerols are used on every type and size of plane, functioning efficiently on every terrain and in every climate.

THE CLEVELAND PNEUMATIC TOOL COMPANY
AIRCRAFT DIVISION • • CLEVELAND, OHIO

Also Manufacturers of Cleco pneumatic tools for the aircraft and general industry, Cleco sheetholders, Cle-Air shock absorbers for trucks and buses, and Cleveland rock drills for mining and construction work.



*THE SHOCK ABSORBING UNITS ON AN AIRPLANE'S LANDING GEAR; THE NAME IS DERIVED FROM THE WORDS "AIR" AND "OIL"—THE FLUIDS USED TO DISSIPATE THE LANDING SHOCKS



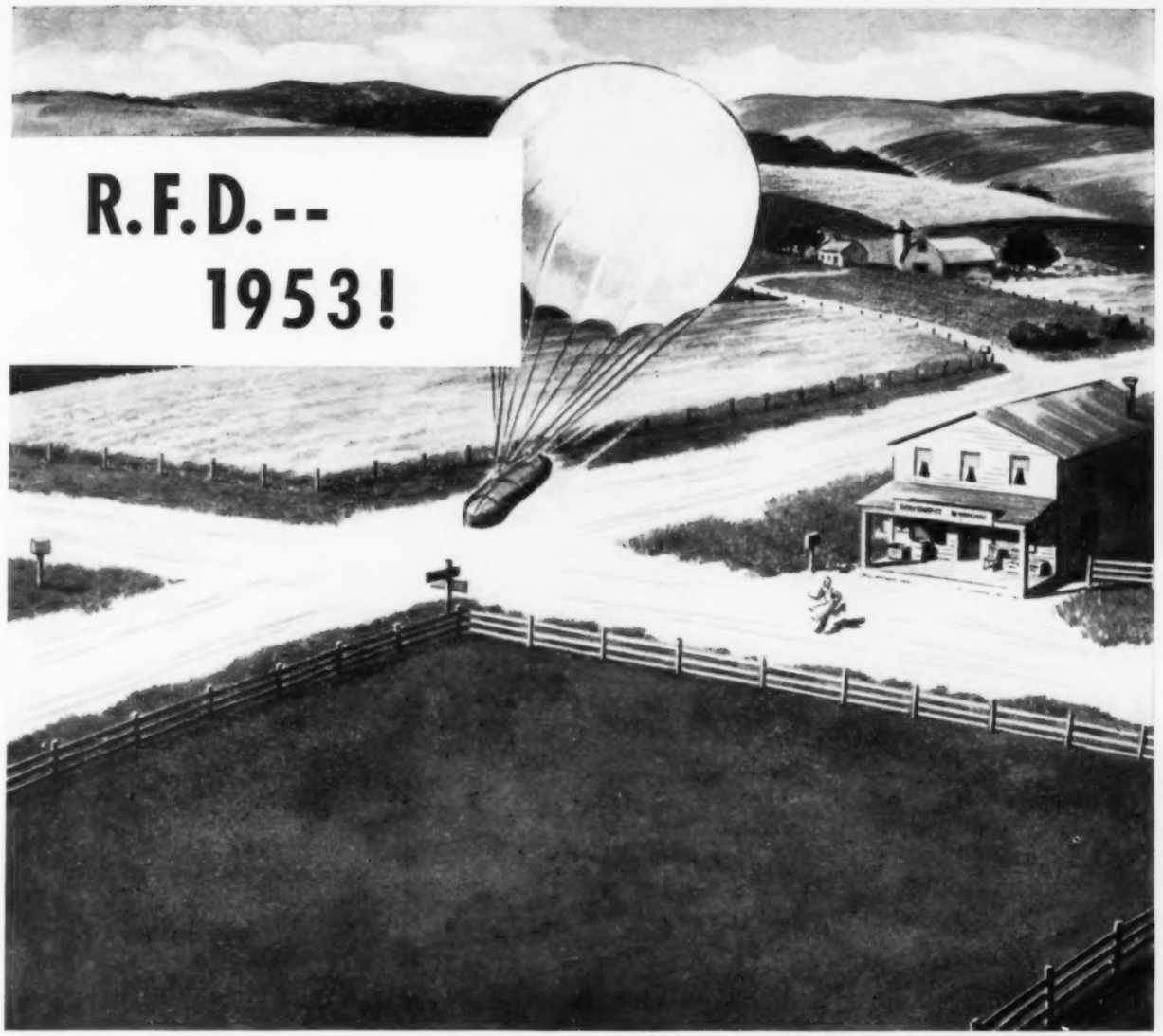
THE GLOBE STARTS ON YOUR MAIN STREET!

In the tomorrow that is nearly today, there will be no limit to the journeys *you* can take by stepping outside *your* front door. Following the peace, air transportation . . . both local and world-wide . . . will encompass *all* the millions of Americans living on friendly Main Streets throughout the 48 states, will enrich *your* life and *your* community.

PRESIDENT

BRANIFF *Airways*

Chicago, Kansas City, Wichita, Oklahoma City, Dallas, Fort Worth, Houston, Amarillo, Wichita Falls, Austin, San Antonio, Corpus Christi, Brownsville.



For years parcels have been delivered by 'chute to remote areas. This quick, sure method will come into even more general practice after the war.

THE parachute has taken its place in the commercial life of this busy nation. Medicine, industrial materials, mail, food—yes, even eggs! —all have in recent years been successfully delivered by parachute, and wartime developments promise many new horizons for the parachute industry when peace comes. By constantly redesigning and improving our 'chutes, by incorporating more safeguards, finding better materials, developing better production methods and lowering costs, Switlik has taken the lead in establishing the place the parachute will occupy in the business and industrial life of the nation after the war.

FIVE REEL SOUND FILM 16MM—*"Parachutes for Safety" may be had for a one-day showing by schools and colleges upon request. This unusual film describes the manufacture, packing, service, maintenance and use of parachutes. For data please write on letterhead to:*

SWITLIK PARACHUTE COMPANY TRENTON, NEW JERSEY

SWITLIK
Safety Chutes
FOR WAR AND PEACE

Comic strip hero to millions is "Smilin' Jack", created by Zack Mosley (below). The cartoonist is a captain on CAP Coastal Patrol in Florida, and has logged many hours over the water in his Stinson Reliant. An Oklahoman, Zack is one of CAP's greatest boosters because of his widely - read and faithfully - executed drawings, which publicize the Army Air Forces as well as the CAP, which now operates under the AAF.

'Smilin' Jack' Boosts

By CAPT. ART KEIL, CAP

SMILIN' JACK, known to millions of newspaper readers as the hero of the nation's Number One adventure strip, is really just a newspaper version of *Smilin' Zack*.

Conversely Zack Mosley is the flesh-and-blood prototype of his comic-page creation and puts a great deal of himself into every picture he draws of his hero. Both the newspaper character and the artist are popular at a certain CAP Coastal Patrol base where Zack flies patrol by day and draws his syndicated strip by night.

Just An Eager Beaver

It is no gag that he's almost always smiling. He's no Pollyanna, but he gets a lot of fun out of life and he gives out plenty, too. (Sometime get him to tell the one about the Grand Central after the beer convention.) While we're on the subject if any of you wandering pilots know a new one, pass it on to Zack and it'll be in mighty good hands for the QB meeting.

Everybody is always asking Zack: "How do you do it?" Meaning, how does he fly patrol, draw a daily adventure strip, a Sunday page with color, create squadron insignia for the CAP and many Army, Navy and Marine units, serve as a PRO attached to National Headquarters of CAP, as wing PRO for Florida, entertain visiting firemen on his own and for CAP, keep up his contacts with all branches of aviation, give and attend parties, and still keep his health.

After watching him for a year we still don't know the answer. Where he gets the energy isn't readily apparent and he says he doesn't eat vitamin pills, but the "how" of the business is fairly obvious. The guy just doesn't ever sleep.

Just now he is improving the modus operandi. Not satisfied with living just off the end of the runway, he is building an auxiliary studio on the upper right hand corner of the hangar at his CAP base. He doesn't want to miss a thing. From the "control tower" as the new studio has been dubbed, he will be able to smell 100 octane all the time and if the Heinies ever get fresh with our high-powered Voyagers he can take his Reliant out and give 'em hell. To keep in complete character he should have a brass pole like the firemen. That's the sort of life he is leading these days.

Twelve Million Followers

On the serious side of the business Zack has a tough job keeping up with the career that brings him grits and gravy. Twelve million avid readers can't be wrong and neither can Zack. Let him make one little technical error in the drawing of a plane, even if it's just rolled out of the factory ramp, and he'll get a mess of critical letters.

Cartooning is far from being a one-man job any more, especially with the fast-changing and highly-technical aspects of present-day military aviation, he says. So he hires an assistant artist who checks details, handles a well-stocked reference library and does a lot of the routine drawing. A secre-

CAP to 12,000,000 Fans

Much credit for public appreciation of the Civil Air Patrol is due Zack Mosley, a clever artist and hard-working Coastal Patrol pilot. His widely-read cartoon series, portraying the adventures of "Smilin' Jack" and his friends, dramatizes CAP activities.

tary also doubles as reference clerk while keeping up with the demand for hand-drawn personal cartoons for individual admirers from many parts of the globe.

As if flying and doing a man-sized cartooning job weren't enough, Zack has taken on still another job. He has created squadron insignia for literally scores of outfits in all branches of the armed forces (including the CAP) by the simple expedient of complying with the requests he gets from the boys in the flying business. And that is a contribution to the war effort in more ways than one. It has necessitated hiring an assistant to the assistant artist to keep up with the demands.

Creator of Insignia

In this field he has a slight gripe. The men who write and ask him to "do" an insignia for their squadron seldom tell him very much about themselves other than the name or number of the outfit. In other words, there's nothing to tell the artist what makes that particular squadron different from the other. After he has "dreamed up" clever drawings for a half dozen similar outfits, it becomes more and more difficult to think up individual ideas for squadrons that are in the same general branch of service.

His insignia for his own Coastal Patrol Base, the first he turned out, is one of his best. The little Stinson Voyager has the worried eyes of a hound pup. He's struggling off with a bomb as big as he is and he's sweating real red blood, while the sub periscope tosses out question marks and exclamation points. It always gets a laugh from a pilot and it also illustrates the pride and affection we have for these little Stinsons that go on hauling an overload day after day for thousands of hours.

Many of Zack's ideas for the adventure strip come from the Air Transport Command pilots who live just down the road a piece. They are

(Continued on page 51)

All work ain't drudgery, says Zack as he sketches his characters from real life. "Li'l De-Icer", the brunette, is a copy of the curvaceous beauty in the strapless bathing suit (right). The hard-hearted blonde (below) is "Cindy", heroine of the cartoon.

MASTER OF MANY CLIMES

You will find the Allison engine busy today in the tropic heat of equatorial regions, and the numbing cold of near-polar areas. ★ You will find it strafing the enemy from the palm tops of jungle country and through the ground haze of the desert—you will meet it, too, in the sub-arctic temperatures of the upper air. ★ But wherever you find it, you find sturdy dependability doing a masterful job, carrying the fighting pilots of the United Nations successfully on their missions—then winging them safely home again. ★ The Allison is manufactured under General Motors standards of engineering, metallurgy and fabrication. ★ Planned from the outset to be one of the world's finest aircraft engines, the Allison is living up to General Motors' purpose in creating it—and in the process proving itself master of every climatic condition under which men fight.

POWERED BY ALLISON

P-38—Lightning
P-39—Airacobra
P-40—Kittyhawk
P-51—Mustang

LIQUID-COOLED AIRCRAFT ENGINES

Allison★

DIVISION OF GM GENERAL MOTORS

Inside this package there's something important...

UNTIL the war is over, there are very few things that we can tell you about the KLYSTRON* tube.

We can say that it is a vital factor in electronics, that it was developed by the Sperry Gyroscope Company following initial research at Stanford University.

Right now, the KLYSTRON* is making very important contributions to essential military equipment. And other advances in this field have been made—after the war is over, some of these will undoubtedly contribute to the security and comfort of a world at peace.

SPERRY

GYROSCOPE COMPANY

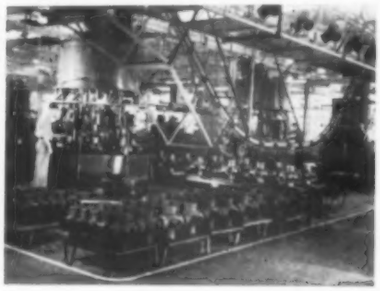
BROOKLYN, NEW YORK

DIVISION OF THE SPERRY CORPORATION

*The names KLYSTRON and RHUMBATRON were officially registered at the U. S. Patent Office on October 3, 1939, by Sperry Gyroscope Company, Inc. KLYSTRON is registration No. 371650. RHUMBATRON is registration No. 371651.

PROP SHOP

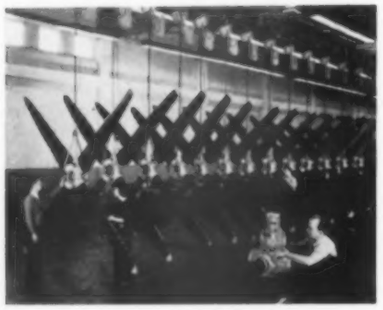
Curtiss-Wright Corporation's newly completed propeller factory in Indiana, the most completely conveyorized propeller factory in the United States, has put quantity production methods in operation to speed mass output of warplane propellers.



Hubs moving along a conveyor line, after rough machining and heat-treating, are brought to the eight-spindle Bullard Multi-au-matics for finish turning, boring and forming.

Blades are sanded to fine finish with modern belt sanders inside small booths equipped with a dust removal system.

"Cuffs" are assembled to the shank end of blades for Curtiss electric propellers.



Completed four-bladed propellers are carried along a conveyor to the final balance room.

WORLD'S FASTEST AIRCRAFT is the distinction claimed by the de Havilland Aircraft Company of Canada, Ltd., for the fighter (shown above) and bomber versions of the plywood-constructed Mosquito. Note eight gun positions in nose, four housing 20 mm cannon and four .303 machine guns. The bomber version carries 2,000 pounds of bombs. It is powered by two Rolls Royce Merlin engines. Performance data has not been released, but de Havilland says it is "faster than the Typhoon, Thunderbolt, Lightning or any other fighter or bomber in operation in the world—this claim was thoroughly investigated before release authorized by the Air Ministry." The craft was designed after the famous de Havilland Comet (1934) and Albatross (1937)

REVVING UP

(Continued from page 12)

the manufacturer, "and would constantly develop new pilots and new planes of all types—thousands of aircraft."

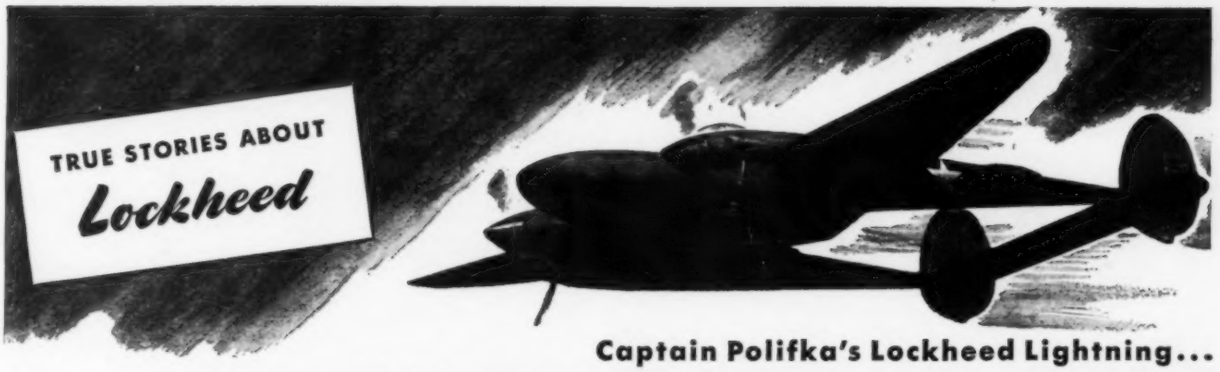
About the size and shape of future airplanes, Woodhead believes competitive experience will establish the most efficient size of craft for short-haul feeder lines, transcontinental transport and transoceanic commerce.

"We have not yet reached design limits on any of the airplanes we have produced, are experimenting with, or have on our drawing boards," he explained. "Large craft will be used to span continents and oceans nonstop. Our company feels that a 400-passenger cargo transport is not too large for transoceanic flights. Ocean liners carry 3,000 passengers or more. We have at the present time a non-flying, full-scale model of such an aircraft and **we intend to build it.** In fact, we are working night and day on it. I can't give you any specifications. But my bet is that it will be in Miami, the key spot for South American operations, when this war is over."

★ ★ ★

HAVE YOU HEARD ABOUT BATTLESHIP "X"? The Navy says it shot down every one of a swarm of Jap dive bombers and torpedo planes which attacked it, and battleship enthusiasts seized upon the feat to revive their queen-of-the-seas harangue. . . . We doubt, however, that Battleship "X" was pursuing the newest tactic developed by British battlewagons. They're said to be using sixteen-inch guns for anti-aircraft work, adapting time fuses to explode the huge projectiles within shrapnel distance of enemy planes "many miles away." . . That sounds like some of Henry J. Kaiser's talk. Now he's quoted as saying he intends to build, "while the war is still raging," a metal cargo plane able to fly 17,000 miles nonstop loaded only with fuel. Such a plane, if it could cruise at 200 m.p.h., would have to be aloft eighty-five hours to go that far. Using a gallon per mile, which would be extremely economical and probably unlikely considering such size, the Kaiser dreamship would need a gas load of fifty-one tons.

A NEW LOW PRESSURE chamber, known as the "Stratotrainer", that simulates altitudes higher than 50,000 feet, "climbs" six times faster than a pursuit ship, has been put into operation by the Boeing Aircraft Company at Seattle, Washington. The stratotrainer will be used for training high altitude crews and for physiological research by the Boeing plant. Dr. Sanford Moss, inventor of the turbo-supercharger, is shown watching the device's first test.



Captain Polifka's Lockheed Lightning...

THE EYES OF THE CORAL SEA BATTLE

Aerial photography has become such an important part of modern warfare that some of our best planes and best pilots have been diverted from actual combat to take the pictures so necessary to victory. It's one sure way to locate the enemy, measure his strength and plan a strategy that will beat him.

Read the exciting story of Captain Polifka and the Lockheed Lightning that became the "eyes of the Coral Sea Battle" and you will understand why the air forces of our Army and Navy can no longer use slow, underpowered planes on important jobs that have a direct bearing on our Freedom.

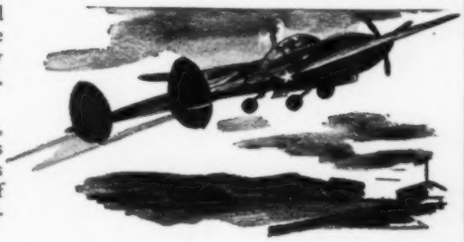
1. Karl Polifka, U. S. Army Captain, was chosen to hunt out the Japs about to attack the U. S. Fleet in the Coral Sea—his duty, to get accurate information on the size and strength of the enemy forces as well as their location. Four powerful aerial cameras were installed in the nose of his Lightning. All guns were removed because of their weight.

2. The Scene of the Coral Sea Battle is shown on this map. The lighter area within the circle was covered completely by Captain Polifka. Developed prints of this immense region, though taken from an altitude of 25,000 feet, were amazingly accurate to within eight feet.

3. Over the Coral Sea, Captain Polifka took pictures—pictures of land, water and ships that helped us plan victory. All four cameras were syncronized...one shooting forward...one to the back...and one on each side. With one "click" of the four shutters they accurately and simultaneously photographed an area of 2,500 sq. miles.

4. Polifka's Lockheed Lightning proved its superiority over Japanese Zeros during this mission. Over Rabaul, ten of these fast planes took up the chase. Jamming the throttle home, Polifka out-sped, out-climbed them all, and did it with one engine functioning imperfectly.

5. On to Salamaua and Lae sped Polifka to finish his reconnaisance job. Here three more Zeros swooped in to attack. Climbing, diving, hiding in clouds, the Lightning shook them again and on one motor flew to Port Moresby where the pictures were delivered.



6. While he was reporting to Col. "Buzz" Wagner, the flying hero of the Philippines, Japanese planes attacked the airfield. But Polifka, confident of his plane even on one engine—took off in the thick of the raid and flew to the safety of his home base hidden deep in the jungle twenty miles away.

This is one of a series of stories about Lockheed...its men...its accomplishments. Watch the pages of this magazine for another thrilling aviation adventure.

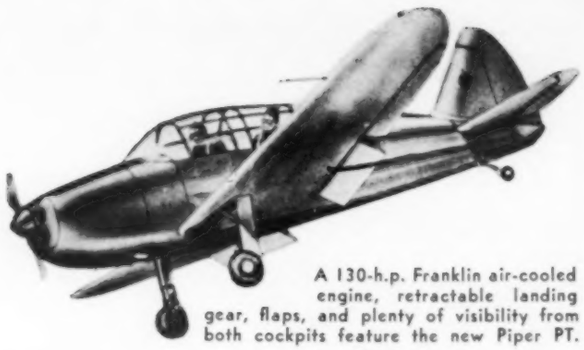
LOOK TO

Lockheed

FOR LEADERSHIP

Lockheed Aircraft Corporation, Vega Aircraft Corporation, Burbank, California, U. S. A.

'3-in-1' TRAINER PRODUCED BY PIPER



A 130-h.p. Franklin air-cooled engine, retractable landing gear, flaps, and plenty of visibility from both cockpits feature the new Piper PT.

Bill Piper's newest model incorporates features designed to equip the flight-training operator with one plane serving three stages of instruction. Its designer, 27-year-old Dave Long, got his ideas from experience as a CPT contractor.

A SLEEK, highly-streamlined, multi-purpose, low-wing trainer has been developed by the Piper Aircraft Corporation. Its cruising speed of 135 m.p.h., 700-mile cruising range and retractable landing gear are pointed out by Piper as meeting the needs of CPT operators who have long wanted a multi-purpose trainer fulfilling requirements of primary flight training while serving at the same time for transitional operations and for cross-country instruction.

Development of the Piper PT was under the supervision of Chief Engineer Walter Jamouneau, who developed the widely-used Cub J-3. The new model was designed by twenty-seven-year-old Dave Long, whose ten years of aviation experience include work as mechanic, pilot-instructor, engineer and designer. Until recently Long operated a CPTP school in addition to his duties at Piper, and carried through eight programs. He did much of the instructing himself. In the design and layout work, Long was assisted by Pulaski Broward, and George Hemphill, another Piper engineer, assisted in the experimental work.

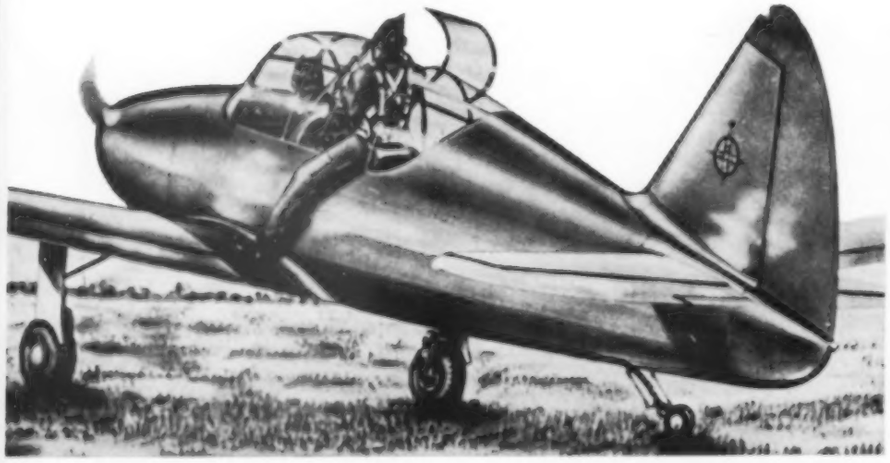
Versatility Cited

Typical of Piper economy, the new PT is relatively low in power and yet very high in performance. At present the ship is powered with a Franklin 130-h.p. six-cylinder horizontally opposed motor. This can be increased considerably without any structural change since the ship has excessive margins of safety. However, no increase in horsepower seems imperative since the ship will carry through all the aerobatics smoothly without "stalling out". This "stalling out" is a common tendency in higher powered airplanes unless care is taken to attain excessive speed before the maneuver is begun, due to the high drag coefficients of such planes. Not so with the Piper PT. Little or no diving of the ship is required in practically all of the normal aerobatics.

At the same time, utilizing a modified version of the airfoil section used on the Piper trainers in the past, the ship has excellent stall and spin characteristics. The Piper J-3 uses the USA 35B basic section which is a high-lift airfoil. The PT, using the USA 35B15 at the root, and 35B10 at the theoretical tip, has retained the high-lift characteristic and has at the same time attained a much higher speed than could be accomplished with the basic unmodified section.

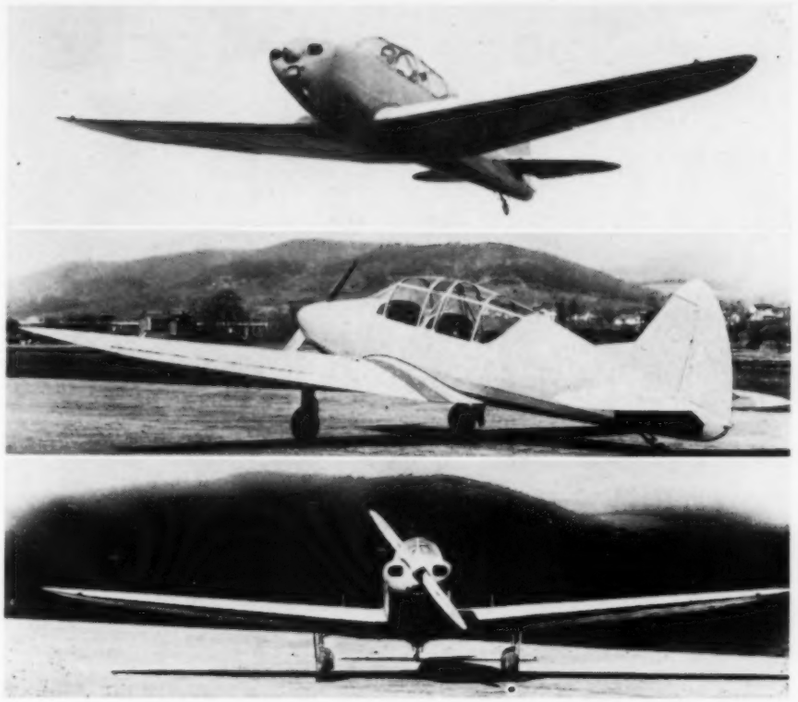
This gives the PT the ability to land at a speed only slightly above that of the standard Piper high-wing trainer which itself is unparalleled in safety of landing. At the same time, it gets off readily and with the pep that is necessary in a primary trainer. For the more advanced transitional training, the ship is equipped with NACA slotted flaps.

In addition to the flaps, the ship has retractable landing gear. In the early stages of instruction most instructors agree that it is not wise to confuse the student with the operation of too many supplementary controls. During this period, the PT may be flown with gear remaining fixed. The pilot will find that the ship will perform, gear down, with all the maneuverability required in the early training stages.



Later, when the curriculum requires, the retractable gear may be utilized, and the advanced aerobatics performed with the ease and finesse possible only in a clean airplane. The retracting mechanism is at present operated by hand, but in future production will be electrically operated. The gear is self-locking through an irreversible screw mechanism and has visual indicators in each cockpit, as well as an aural warning device.

The Piper PT incorporates a number of important safety features. One of these is the high degree of visibility, unusual in a ship of such clean lines. This excellent visibility, supplemented by the wide tread of the oleo spring-type gear (100″) and the military type (toe) hydraulic brakes, make taxiing a pleasure rather than an unnerving task—especially to the beginner. Adjustable seats having an up-down travel of six inches also aid immeasurably. Affording the pilot an over-the-nose view of the ground a short distance ahead of the ship in three-point position, it affords excellent visibility in the air.



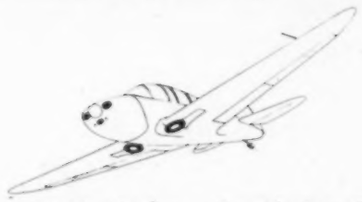
Full Controls Fore and Aft

Among other operator-dictated innovations in the Piper PT is its ability to be flown solo from either the front or rear with equal facility. Front and rear cockpits are identically outfitted. All instruments and controls are dual and are identically located, as well as being readily accessible to the pilot. From the pilot's point of view, these are very important factors. Many operators have reported solo-accidents which could be traced directly to the fact that the student was flying the front or rear for the first time and was confused by the different location of, or the absence of some instrument or control.

In addition to primary controls, each cockpit includes the following controls and instruments: flap control, parking brake, gear retracting mechanism control, wobble-pump, starter, carburetor heat, cabin heat, fuel selector valve, airspeed indicator, bank and turn indicator, rate of climb indicator, altimeter, clock, compass, tachometer, oil thermometer, fuel pressure and oil pressure gage. Fuel gages are on each wing directly above wing tanks, easily visible from either cockpit. Navigation lights are installed as standard equipment, and for night flying, provision is made for the installation of landing lights and flares. For instrument training, an auxiliary panel is installed above the standard rear panel, attaching to the nose-over struc-

(Continued on page 30)

SPECIFICATIONS AND PERFORMANCE



Power—Franklin 6 AC 298, 130 h.p., horizontally opposed.
Maximum Speed—Over 150 m.p.h.
Cruising Speed—Over 135 m.p.h.
Landing Speed—Under 50 m.p.h.
Rate of Climb—750-1,000 ft. per min., depending upon propeller used.
Cruising Range—700 miles.
Empty Weight—1,325 Lbs.
Useful Load—675 Lbs.
Gross Weight—2,000 Lbs.
Wing Span—34 Ft.
Length Overall—22 Ft.-10 In.
Height Overall—6 Ft.-6 In.
Wing Area—164 Sq. Ft.
Wing Loading—12.2 Lbs./Sq. Ft.
Power Loading—15.4 Lbs./h.p.
Aileron Area—15.4 Sq. Ft.
Flap Area—13.8 Sq. Ft.
Stabilizer Area—15.2 Sq. Ft.
Elevator Area—12.2 Sq. Ft.
Fin Area—5.9 Sq. Ft.
Rudder Area—5.8 Sq. Ft.
Fuel Capacity—40 Gal.

THIS HAPPY QUARTET EXPECTS BIG FUTURE for the new Piper multi-purpose low-wing trainer. Left to right is William T. Piper, president, with Engineers Walter Jamouneau, Dave Long and George Hemphill. Jamouneau developed the famous Piper J-3. The low-wing was designed by Long, 27-year-old dynamo.

New Short-Haul Transport By Cessna

A new cargo plane, the Cessna "Loadmaster," recently completed preliminary factory tests at the Cessna Aircraft Co., Wichita, Kansas, and flight tests by the Army Air Forces will be made soon.

The Loadmaster was designed as a "frontline dispatcher" to carry men and supplies from main air fields and supply bases to the actual battle areas, landing and taking off on small fields which larger transports cannot use.

Powered by two 600-h.p. Pratt & Whitney motors, it has a high pay-load per pound with high speed, safety and flexibility of use. The fuselage is of welded steel tubing, the wings of plastic plywood, and the entire structure fabric-covered. Cessna engineers stated that a composite of steel tubing and plywood makes the Loadmaster lighter than an all-plywood craft, conserves strategic metals, and the difference in weight from all-plywood construction is converted to additional pay-load capacity and speed. It is similar in construction to the British Mosquito bomber.

The Cessna plants at Wichita and Hutchinson, Kansas, can be quickly set up for construction of the new cargo ship, if accepted by the Army, with many of the smaller parts and assemblies being delegated to subcontractors, while plant facilities are devoted chiefly to fabrication and assembly, Dwane and Dwight Wallace, executive heads of Cessna, said.

FRONT LINE DISPATCHER is what the designers call this twin-engined Loadmaster, the latest type produced by Cessna Aircraft Company at Wichita, Kansas. Its mission will be to operate from small fields to dispatch supplies and men to battle areas from nearby supply bases and air bases.

"3-IN-1" TRAINER

(Continued from page 29)

ture. This panel includes the remaining blind-flight instruments necessary, as well as radio equipment which can be operated from either cockpit.

Comfort and convenience for the pilot has been an important criterion in the design of the PT. Adjustable rudder pedals, as well as adjustable seat, are installed for the accommodation of pilots of varying heights. Unlike most primary trainers, the Piper cockpits are hatch-enclosed. This should be of especial interest to Northern operators who are continually complaining of the extreme discomfort of the conventional open-cockpit primary trainers. On the other hand the new PT enclosure is so designed that both side window sections may be lowered, thereby achieving the advantages of the open cockpit and at the same time, with the top hinging section remaining closed, eliminating the turbulence which occurs in the case of the open-cockpit ship.

Construction and Maintenance

Non-strategic material has been used wherever possible in the construction of the Piper PT but no compromise has been made which would sacrifice the sturdy resistance so essential in this type of plane. Special care was taken in designing the ship to insure ease of maintenance so as to derive the greatest amount of service from the ship and as little time as possible lost in overhauls, inspections, and repairs.

The fuselage is the conventional steel tubular Warren truss construction, with integral nose-over structure located between cockpits. The No. 1 (firewall) bulkhead includes fittings for attachment of the engine mount by four bolts. Wood stringers are used throughout and the turtleback is of plywood construction. These combine to give the fuselage a general elliptical section.

The conventional steel tubular fuselage was adhered to for production simplicity and ease of maintenance. This also aids immeasurably in the attachment of high-stress fittings. For fuselage inspection, future models will incorporate removable plywood side panels aft of the rear cockpit. The motor is easily reached through large access doors hinged near the top center and extending two-thirds of the way down the side of the motor cowl. The fuselage is fabric covered throughout with the exception of removable inspection panels extending from the firewall to the front cockpit.

The hatch (enclosure) incorporates a top section hinging on the right side, with sliding windows on each side. Entrance is gained by sliding the left window down and opening the top section. With top section secured, the ship can then be flown with side windows either up or down.

An added feature is the inclusion of an odometer on the front tachometer. Based on the average r.p.m. through all operations, this instrument clocks the operating time, and will prove an invaluable aid in accounting for periodic inspections as well as in checking oil and fuel consumption, etc.

Wings are full cantiliver, built-up box-type mono-spar, with wooden ribs. They are composed of a center section and two outer panels joining outboard of the landing gear attachment. An auxiliary rear spar carries the aileron and flap brackets. The wings have a two-to-one taper ratio with 6° dihedral, and enough washout (twist) to avoid unfavorable stall characteristics. The center section carries, in addition to the landing gear and retracting mechanism, two stainless steel fuel tanks having a total capacity of forty gallons. Wings are covered with three-thirty-second mahogany diagonal plywood. This is in turn covered with fabric to facilitate standard finishing procedures and to protect the surface against the elements.

Fin and stabilizer are plywood and fabric covered, and are of full cantilever construction. Rudder and elevator are fabric covered as are the other movable control surfaces (ailerons and flaps).

WOMEN ARE UNDER FIRE, TOO!

An Ack-Ack barrage—even in miniature—is tough on a woman. Yet, some of the hard and brilliant work they are doing in industry *must* be done under fire.

American women deserve a home life, too. So now's the time to pitch in with everything we've got to whip the Axis. That is the spirit Solar relies on to produce adequate numbers of "anti-monoxide" exhaust manifolds for the fighting airplanes of the United Nations.

ARMY E NAVY

SOLAR

EXHAUST SYSTEMS—

SOLAR AIRCRAFT COMPANY ★ SAN DIEGO, CALIFORNIA

FIRE PROTECTION

In Airplane Maintenance and Overhaul Bases

WITH the advance of aviation, it has become necessary to establish large airplane maintenance and overhaul bases. At such a base, the various component parts of airplanes are overhauled or replaced in accordance with established schedules. Among items requiring overhaul are engines, ignition systems, storage batteries, carburetors, propellers, wing, fuselage and tail assemblies, hydraulic systems, landing gears and numerous instruments. Furthermore, cabin interiors must be renewed and painted, and seats must be reupholstered. Gasoline and oil tanks must be cleaned and inspected. Fabric-covered, movable control surfaces, such as ailerons, rudders and elevators must be recovered and painted. These and numerous other minor operations bring about a combination of circumstances or conditions infrequently encountered in manufacturing plants.

Basically, the general precautions for fire protection, common to all industrial buildings, apply as well to airplane maintenance and overhaul bases. Proper segregation of hazardous functions, adequate standpipe and sprinkler systems, an adequate number of the proper type of fire extinguishers, good housekeeping, fire alarm systems, trained fire brigades, proper maintenance of machinery and equipment—all are essential. In addition, certain other precautions are necessary to cope with the special fire hazards encountered.

Careful Planning Vital

The planning of the various hangars, shops and stock rooms requires careful study. A tendency exists to increase the size of hangars beyond proportions in accordance with good fire protection standards. The reasons for this are twofold. First, larger hangars provide a better utilization of floor area for the storage of airplanes. Second, provision for future aircraft, the dimensions of which are not certain. A sensible approach to the problem is necessary. Certainly the provision of storage facilities for a large number of airplanes under one roof does not seem advisable. A proper subdivision of values should be maintained even at a premium in initial construction costs. As to future requirements, the dimensions of future aircraft for the next five years can be fairly well determined. Should larger aircraft become feasible after this period, it will undoubtedly be found necessary to service some of these airplanes outdoors or in special nose-sheds which would afford weather protection for working on the engines at the front end of the ship.

Hangars must be separated, even if only by the use of fire walls. No welding should be permitted in a hangar. Spraying, insofar as possible, should not be permitted in a hangar. Separate areas, properly enclosed with fire walls, should be provided for such operations and functions as the following: engine disassembly, including the cleaning of all engine parts, battery charging, battery repairing, plating, upholstering and fabric covering, paint spraying and doping, carburetor testing, welding, cleaning of oil and gasoline tanks, and engine testing.

(Continued on page 34)

By HERMAN SCHLOSSER
Asst. Plant Engineer
American Airlines, Inc.

Delivered before the National Safety Council's Air Transport Section at the Greater New York Safety Conference.

How to promote safety at busy maintenance and overhaul bases which are mushrooming wherever extensive flight operations are scheduled in training, transport and combat.

CLEANLINESS AND ORDERLY ARRANGEMENT promote safety in this large American Airlines hangar-shop at New York. Lessons learned from peacetime operations have been effected by American Airlines in its many and varied wartime projects under crowded conditions and involving military aircraft.

Easy does it

One of the most important jobs at Boeing is making other Boeing jobs easier . . . simplifying procedures so that, despite shortages of skilled workers, production constantly goes upward.

Above is pictured an example of this easy-does-it manufacturing philosophy—a simple device, but it illustrates the point: the Boeing-developed wheel-installation dolly, by means of which *one* worker slips quarter-ton wheels onto the axles of Boeing Flying Fortresses.* The wheel, held firmly on the dolly by adjustable arms, is rolled into position on casters. Once the wheel is slipped over the landing-gear axle, the arms of the dolly are moved back . . . and the job is done.

This is but a simple example, and only one among hundreds, of the constant effort in Boeing plants (at Seattle and Renton, Washington, Wichita, Kansas, and Vancouver, B. C.) to achieve maximum production efficiency with a minimum of human exertion, through improved tools and handling equipment . . . an effort which has contributed to *the highest output per man, machine and unit of plant space*, among all manufacturers of aircraft.

Co-ordinated with Boeing know-how in research, design and more than twenty-five different engineering fields, this manufacturing skill has made Boeing-designed and Boeing-built Flying Fortresses renowned not only for *quality* but for *quantity*.

And in the peacetime to come, these same skills will make the phrase "Built by Boeing" a hall-mark of skilfully designed, soundly engineered, efficiently manufactured products.

DESIGNERS OF THE FLYING FORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

*THE TERMS "FLYING FORTRESS" AND "STRATOLINER" ARE REGISTERED BOEING TRADE-MARKS

FIRE PROTECTION

(Continued from page 32)

Stock rooms should be separated from hangars and shops. They should be laid out with provision for adequate aisles and should be provided with metal storage bins and racks. The large quantity and variety of items which must be stocked simplifies the problem of proper segregation of combustible materials. Small quantities of combustible items can and should be distributed and interspersed with non-combustible stock to prevent the spread of fire. There are, however, certain types of stock at an airplane maintenance and overhaul base which must be stored in separate buildings. Such items include flares, paints, lacquers, dope and thinners. The quantity of such volatile and inflammable liquids which must be stored warrants a separate building at a safe distance—50 to 100 feet—away from other buildings. Unless special precautions are taken in recognition of the hazard, above-ground gasoline storage tanks should be located a minimum distance of 100 feet away from all buildings. Underground gasoline storage tanks should be provided in preference to above-ground tanks. An hydraulic system for the storage and dispensing of gasoline is by far the safest method in existence today. In employing this system, gasoline tanks are always completely filled with liquid consisting of varying quantities of gasoline and water. Partially empty tanks with their resulting gasoline vapor content are eliminated and explosion and fire hazards are reduced. Venting hazards are eliminated.

Offices for the general staff should preferably be housed in a detached office building separated from hangars and shops. In this manner panic in such offices due to smoke and fumes from fires in hangars and shops can be eliminated.

The general planning must of necessity include a building for the housing of water storage tanks, pumps and equipment for supplying the standpipe and sprinkler systems. This building should be isolated from all other buildings, for if it be located next to any of the hangars or shops, a serious fire or explosion in such an adjoining building might likewise affect or destroy the sprinkler pumping equipment and water storage tanks.

Construction Pointers

The type of construction for the various buildings will be our next consideration. All buildings should be of fireproof construction with skeleton steel floor, wall and roof framing, properly fireproofed. Walls should be of masonry supported on steel framing. Floor and roof slabs should be of reinforced concrete. This method of construction offers the best protection for the type of fires and explosions which might occur at any airplane maintenance and overhaul base. Explosion relief should be provided by the generous use of windows in exterior walls and doors.

FIRE EXTINGUISHERS are always handy around American Airlines operations. Here's a battery cart amply equipped with emergency equipment.

The foregoing construction is suitable for all shops and stockrooms. Hangars, however, cannot readily be roofed with fireproofed construction, both for economical reasons and from an engineering standpoint. Hangar roof constructions should be of incombustible materials such as structural steel trusses and intermediate steel framing members with a masonry plank roof.

Vapor proof and explosion proof electric lighting fixtures, switches, receptacles and motors should be provided in accordance with recommended practice. All spray booths should have exhaust fans with non-sparking blades. All electric appliances, switches, receptacles, motors, panels, etc. in a hangar and situated less than four feet above the floor should be explosion proof. All buildings should be provided with adequate standpipe and sprinkler systems. Standpipe systems present no special problems. The conventional methods and regulations for the installation of standpipe systems in average industrial buildings apply as well to airplane maintenance and overhaul bases. The sprinkler systems in shops and stockrooms can be conventional wetpipe systems. Sprinkler systems for hangars, however, present special problems. The distance from the floor to the underside of roof trusses in the average modern hangar varies from thirty-five to forty feet. To this dimension must be added the distance from the under side of the trusses to the under side of the roof, which distance may vary from three to twenty feet. This results in very high mounting heights for sprinkler heads. The conventional fusible heads are not practical for this purpose. The recommended system for hangars is the open-head, deluge system with heat-actuated devices operating on the rate-of-rise principle.

The area under the hangar roof should be subdivided into sections of 10,000 to 15,000 square feet by the use of so-called draft curtains. These draft curtains should consist of rigid incombustible sheets extending from the under side of the roof to the lower chords of the roof trusses. Open sprinkler heads and heat-actuated devices are installed on the under side of the hangar roof slab.

As an added protection, the installation of a supervisory system on the sprinkler system is very desirable. Such a provision will assure that valves are open and that the sprinkler system in general is in working order.

Necessary Emergency Equipment

Equally important as the sprinkler system is the provision of an adequate number and proper type of fire extinguishers and fire fighting apparatus and equipment. Many more classes of fire risks are encountered at an airplane maintenance and overhaul base than in the conventional factory. Furthermore, the presence of gasoline, lacquers, thinners and other highly volatile and inflammable liquids demands that incipient fires be extinguished immediately or large fires will quickly result. Consequently, the provision of a large number of small hand-type extinguishers, strategically located, is of utmost importance.

(Continued on page 39)

Out of the Ground Into Finished Parts for Planes

ROUTING: With continuous expansion, Reynolds now is equipped and staffed for all types of routing operations. All manufacturers have to do is to supply the blue prints and templates. Reynolds makes the tools and furnishes you finished routed parts.

SAVE MANPOWER

THE armed services are calling more men every day. Farms and factories alike face a critical shortage of trained workers.

Manpower is the big problem this year . . . and Reynolds has prepared to help you meet it, like we are helping other aircraft manufacturers — by finishing aircraft parts *at the aluminum source*.

For over a year, we've been training women workers for our Parts Division in Louisville. Recently, we have expanded our parts' facilities — added 250,000 square feet of floor space for parts-making alone.

Now, as the result of this training and expansion program, we have immediate open capacity to finish flat and formed parts to your exact engineering specifications — to relieve skilled labor in your plants for other important work in aircraft factories.

Call our representative in your city. Tell him your individual parts-making problem. Let us help you conserve precious manpower now.

SHEARING: As the result of extensive adaptations of machines, Reynolds has a large capacity for shearing operations. Equipment includes batteries of 6, 8, 10, 12 and 14-foot power shears for handling required dimensions..

SAVE PLANT SPACE

UNDER your present set-up you're probably using valuable space finishing parts and handling and storing scrap in your plants — space that you need . . . that you could use immediately . . . in your assembly operations.

With finished aluminum parts flowing to your assembly lines direct from Reynolds, you save this floor space for important work that cannot be done outside your aircraft plants.

Yes, and you save vital tools and critical machines, too. Often Reynolds finishes identical parts for several manufacturers making the same planes, thus eliminating the necessity for high-cost small-volume runs in aircraft plants.

PUNCH PRESSES: For months, Reynolds has been adding punch press facilities and training women operators. Now, with a reservoir of trained women, we can handle a much greater volume of this operation.

SAVE SCRAP HANDLING

REYNOLDS finished parts save the time, waste effort and needless expense now involved in handling and shipping scrap.

Under the Reynolds plan, scrap from routing, shearing and blanking is free from contamination and is immediately re-rolled into prime sheet. Overnight, the scrap is put right back into more parts to increase our production for you. In these days of ingot shortages, this vital scrap is never allowed to be idle. It's in production all the time.

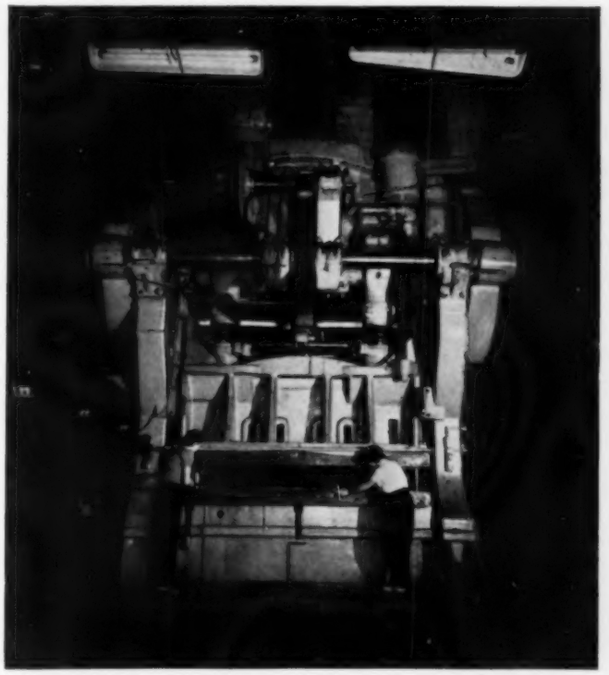
Needless cross-hauling is eliminated, freeing hundreds of freight cars every year. In figuring prices on aircraft parts, Reynolds allows plane manufacturers the full ceiling prices for scrap accumulated. This saves the entire cost of handling scrap.

Your whole operation is simplified and more efficient. You buy only what you can use . . . finished aircraft parts. And you get more of them . . . faster . . . to meet your stepped up schedules.

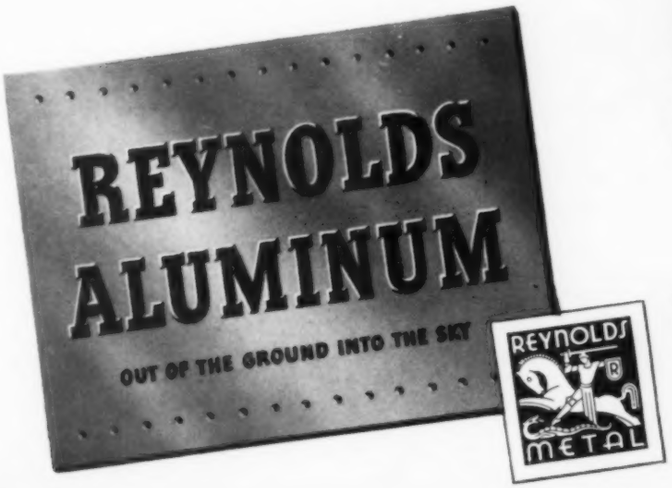
..with Reynolds Fabricated Parts!

INSPECTION: Reynolds' finished parts meet the same high standards as Reynolds Aluminum itself. Every piece is meticulously inspected at various stages in the process of fabrication and in the final inspection department before shipment. Army and Navy inspectors, as well as Reynolds' inspectors, are on the job all the time to make certain that each order meets exact specifications as to chemical and physical properties, size, hardness and surface.

ANODIZING AND PAINTING: To make its fabricating service complete, Reynolds has added anodizing, chromidizing and painting facilities and has trained personnel for these operations. Thus, this service takes every parts-making headache away from aircraft manufacturers.



GIANT PRESSES: From factories formerly turning out civilian products, Reynolds has obtained huge batteries of mechanical and hydraulic presses. These presses range from the smallest sizes to this 1300-ton giant.



NO SCRAP...

YOU BUY PARTS
READY FOR ASSEMBLY!

Facts About YOUR New Source of ALUMINUM

Virtually every warplane that you of the American aircraft industry are speeding to the fighting fronts, carries some Reynolds Aluminum into battle. Reynolds created a new source of aluminum long before Pearl Harbor, and today Reynolds is pushing a steady flow of this precious metal to your plants. Here are some of the things we have done... and are doing now... to help you win this war... and the peace to come... with more aluminum:

TWENTY YEARS' EXPERIENCE IN ALUMINUM: The two decades between world wars saw Reynolds piling up priceless experience, rolling light metal in tremendous volume. As America's largest aluminum foil producer, we rolled more square miles of light-gauge metal than any other manufacturer in the entire world.

SAW AMERICA'S NEED AND STARTED ACTION: 'Way back in 1939, when the Axis' aluminum output was twice that of the United States, Reynolds foresaw America's coming need and started action. We mortgaged all of our resources to expand our aluminum facilities.

MINED OWN BAUXITE ORE IN AMERICA: In 1940 and '41, when gray Nazi waves swept over France, Reynolds prepared. We started mining our own Bauxite in Arkansas. We built mammoth new plants to carry it through to finished metal, including one giant at Listerhill, Ala., where Bauxite flows in one side and aluminum sheet for aircraft flows out the other.

NEW SOURCE ROLLING WHEN WAR CAME: On fateful Dec. 7th, when the Japs struck, Reynolds was ready and rolling with virgin aluminum plants, rolling mills and rod mills at Listerhill, Ala. — with ingot molding units at Longview, Wash. — with sheet plants, rod mills, and extrusion plants in Louisville, Ky. — and with expanding sheet facilities at Richmond, Va.

NOW SERVING THOUSANDS OF WAR PLANTS: As America plunged deeper into all-out war, Reynolds dug deeper into its Bauxite hills and multiplied production manyfold. Now Reynolds alone is mining 36% more Bauxite ore than was mined in the entire nation three years ago. We're turning out hundreds of millions of pounds of aluminum to feed literally thousands of war plants. Our 37 factories in 13 states are operating 24 hours a day.

PREMIUM METAL . . . 99.85 PER CENT PURE: Reynolds uses the modern continuous electrode process. This simplified production helped raise the purity of the Reynolds product above the average of the aluminum industry. Today, 99% of the output of our newest plant is premium metal with a purity of 99.60% or higher. Substantial quantities are 99.85% pure.

VISION AND PRECISION FOR YOUR PROBLEMS: With this record of foresight and initiative, Reynolds offers the products and services of a great new independent aluminum source. We're ready now to analyze your individual aluminum needs — to give them the same precision planning and prompt action that has gone into the building of our own organization. Feel free to call on us now — and always.

REYNOLDS METALS COMPANY
General Offices, Richmond, Va.
Parts Division, Louisville, Ky.
37 Plants in 13 States

FIRE PROTECTION

(Continued from page 34)

The nature of fire risks in hangars and shops demands the installation of foam-and-carbon-dioxide extinguishers and also sand buckets.

Water-type extinguishers are of little use except in stock rooms and offices. Should water be required in hangars or shops, it would be needed in such quantities that only a standpipe or sprinkler system would be able to provide a sufficient quantity. The number of extinguishers required in a hangar can be approximated as follows: for each 4,500 to 5,000 square feet of floor area, provide a group of extinguishers consisting of one two-and-one-half-gallon foam extinguisher, one ten-pound carbon dioxide extinguisher and three ten-quart sand buckets. Fifteen-pound carbon dioxide extinguishers have been found to be too heavy for quick use, especially in and around airplanes. In addition, each hangar should be provided with at least one forty-gallon foam cart and one fifty-pound carbon dioxide extinguisher on wheels.

Fire extinguishers for shops should be provided to cover specific risks. For example, the engine disassembly shop would probably contain some soaking or cleaning tanks filled with inflammable liquid. Foam extinguishers are best suited for such risks. Small spray booths would also be located in this shop for cleaning and spraying parts with light oil. A one-quart carbon tetrachloride extinguisher should be attached to each small spray booth. A few ten or fifteen-pound carbon dioxide extinguishers should also be provided in the area. In the case of a room used for the testing of carburetors utilizing a gasoline flow test, a different solution is required. For this risk, a few one-quart carbon tetrachloride extinguishers and an adequate number of carbon dioxide extinguishers must be provided. In addition to the foregoing provisions, approximately 25 per cent of all workbenches and stands in hangars and shops should be equipped with one-quart carbon tetrachloride extinguishers for use on small electrical and miscellaneous fires.

An important consideration is the fire fighting apparatus which should be stationed at an airplane maintenance and overhaul base. Since airplane fires gain headway with alarming rapidity, it is not feasible to await the arrival of apparatus from a nearby firehouse. Certain apparatus must be stationed at the airport and must be suitable and adequate for coping with fires in the buildings, as well as fires which may occur in planes parked or being serviced outdoors on the ramps in front of hangars. Such apparatus should include a water tank truck with pump and a solution for generating foam, a general-purpose truck with axes, fire hooks, rain coats, boots, helmets, first-aid equipment and the like, a truck containing large quantities of carbon dioxide and a truck equipped with considerable hose, large quantities of foam powder in handy containers and two foam hoppers for generating foam. This latter truck will permit the stringing of hose from hydrants to the location of a plane fire anywhere on the airport and the utilization of foam on the fire. The effective coverage or range of the truck is limited, however, by the location of hydrants. In the case of a crash landing, for example, the truck could not be used unless flush hydrants were provided in the landing field along the several runways. A separate building should be provided for the proper storage and maintenance of the aforementioned pieces of fire apparatus.

Fire Brigades Need Training

From all the foregoing statements it becomes apparent that an airplane maintenance and overhaul base must have well-trained and organized fire brigades. The types of fires encountered spread with such rapidity that to await the arrival of the fire department often is to invite disaster. The condition is further aggravated by the fact that airports are of necessity located in outlying districts where fire houses are few and far distant. Consequently, fire brigades composed of employes are essential in order to provide a fire department which will be available at the start of any fire. Members of these fire brigades should receive a comprehensive course of instruction covering the proper methods of control and extinguishment of fires which might be encountered. They should be familiarized with the complete layout and hazards of the plant and be instructed as to the proper function and use of the standpipe and sprinkler systems. A complete course of instructions covering the proper use and operation of the various types of fire extinguishers should be given. These instructions should be supplemented by actual demonstrations and tests of fire extinguishers on various

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★ ABILITY

★ PRECISION

★ PRODUCTION

DOLAN AIRCRAFT MANUFACTURING COMPANY

DALLAS, TEXAS

—Texas A. & M. Photo.

EXPERTS IN EDUCATIONAL TRAINING discussed problems and the future outlook at the Texas Aviation Conference. Left to right, are Howard Barlow, head of the Aeronautical Engineering Department at A. & M. College and co-chairman of the Conference; R. W. Logan, Braniff Airways, Dallas; E. L. Williams, Industrial Education Department, A. & M.; E. J. Schetler, Consolidated Vultee Aircraft Corporation, Nashville; Ross Peterson, North American Aviation, Inc., Dallas; C. T. Reid, Douglas Aircraft Company, Santa Monica; Tom Faulconer, Consolidated Vultee Aircraft Corp., San Diego; F. D. Bidlfike, Douglas Aircraft Company, Oklahoma City; and Van A. France, Consolidated Vultee Aircraft Corp., Fort Worth.

TEXAS A. & M. HOST FOR WARTIME CONFERENCE

AVIATION leaders of the South, representing manufacturing, operating and training activities, gathered on May 6-8 at College Station, Texas, for the Second Annual Texas Aviation Week Conference, sponsored jointly by Texas A. & M. College and SOUTHERN FLIGHT. In important day and night sessions, they heard leaders from other sections of the nation and discussed common problems and their solutions.

Featuring the Conference were addresses by William B. Stout, famous aviation researcher of the Consolidated Vultee organization; Major General Gerald C. Brant, commanding general of the Army Air Forces' Gulf Coast Training Center and long-time champion of aviation development in Texas and neighboring states; T. E. Braniff, president of Braniff Airways, Inc.; and Lt. Col. Earle L. Johnson, national commander of the Civil Air Patrol.

Aviation in World Government

The first world government will be an air government created to determine trade routes and who will fly them, Stout told the conference.

"But this world government must come from scientific facts and developments and not from political beliefs," he added.

"So many trends will come as the result of the war that the basic thing to emphasize is a change in the routing of trade. Why today we can go to Australia quicker than George Washington could drive from New York to Philadelphia.

"The world today is smaller, in point of hours, than the New England States. You can take a puddle jumper and fly the breadth of Texas in less time than you can ride a horse across Rhode Island."

The brisk, bespectacled designer who gave the world the first all-metal airplane in 1919; who, in 1918 developed the first thick-winged plane and who now is deeply involved in the development of a helicopter, said that 85 per cent of all activities now center around transportation.

Stout predicted that the aircraft industry would design autoplanes that seem incredible now.

Local Aviation Needs Stressed

Postwar planning of air transport must be both global and local in scope, said T. E. Braniff, president of Braniff Airways, in a paper read at the Conference by Charles E. Beard, vice president of Braniff.

"The great interest in international air transportation, however, should not eclipse our local interest," he said. "Following the peace, improvements in aircraft and operating technique tested in the furnace of war can make air transportation available to thousands of communities and millions of Americans not now affected. And we must not forget that it is along the Main Streets of these friendly communities . . . of your community and the hundreds like it throughout the land . . . that the economic backbone is formed.

"Though our national interest is today focused principally on a map of the globe, tomorrow our interests will again be much closer home. Any postwar air plan must be *both* local and global in scope . . . must bring benefits to the average folks on the many Main Streets of our country just as it brings benefits to nations and hemispheres. Whether you and I live in a village or a metropolis, there must be no limits to the journeys either of us can take . . . no limit to the markets we can seek for our products nor the sources we can tap for our raw materials."

General Brant, unable to appear because of illness, was represented by Lt. Col. B. E. Nowotny of his staff, who read an address prepared by the General in which he described Uncle Sam's pilots, many thousands of whom are being graduated regularly, as the "world's best." He said Texas A. & M. probably had more graduates wearing AAF wings than any other educational institution in the country. Dean Gibb Gilchrist of A. & M. presided over the session featuring General Brant's address.

Subs Spotted by CAP

Accomplishments of the Civil Air Patrol, the membership of which is approaching the 70,000 mark, were cited by Lt. Col. Earle L. Johnson, national commander, who was the principal speaker at a luncheon devoted to Civil Air Patrol members

(Continued on page 42)

WAR BIRDS COME HOME

Here they come, roaring up astern of the carrier to settle on the wide deck of their floating nest—war birds coming home. For hours, between the blue water and the bluer sky, they have flown their sector, alert, watchful, ready, confident of their ability to cope with any situation.

The confidence of the Navy aviator stems from three sources. His confidence in himself, his plane, and the fuels for his plane. All three of these are the best of their kind. All are the result of study, research, work and American determination that our fighting men shall have the best training and the best weapons it is possible to produce. One of the most potent of our weapons is 100-octane aviation gasoline—a weapon denied our enemies.

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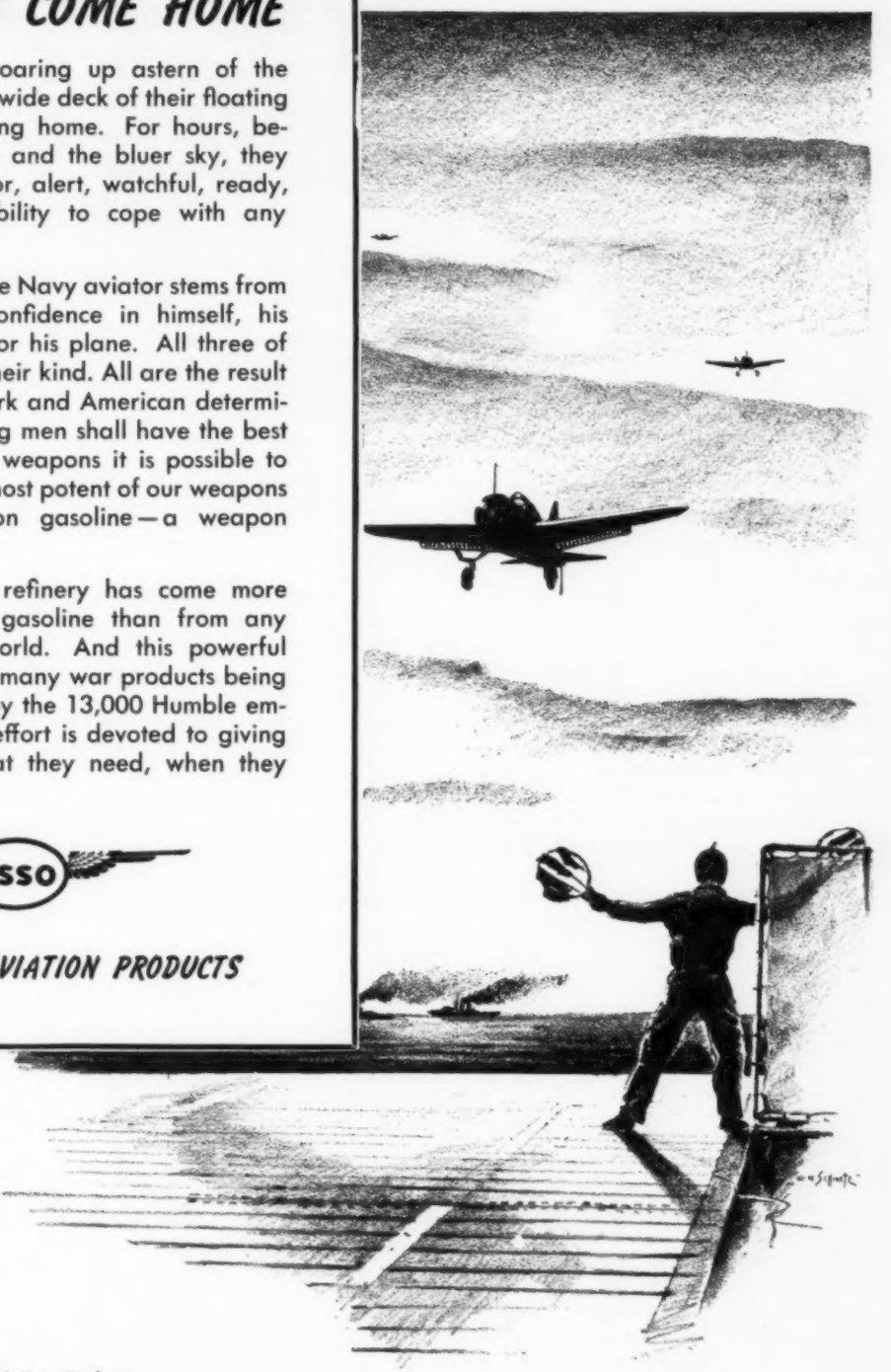

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WARTIME CONFERENCE

(Continued from page 40)

from Texas, Oklahoma, Arkansas and Louisiana.

"The CAP has flown a total of 19,000,000 miles over our coastal waters in the unrelenting search for enemy submarines," Col. Johnson revealed. He did not say how many were destroyed by the planes, that number being a military secret, but CAP planes have spotted numerous enemy subs, he declared. "We have saved fifty-four merchant ships from destruction and we have saved the lives of 354 seamen in distress by locating their position for rescue craft."

Col. Johnson also said that Civil Air Patrol planes on inland search flights had located fifteen of sixteen Army planes which were reported lost on training flights. Over 16,000 members of the CAP have entered the Army, he said.

Postwar Private Flying

Subcontracting discussions were led by Dan Miller of Consolidated Vultee, while M. C. Weber of the same plant discussed production tooling problems.

Mass production will be needed to bring out the "plane of tomorrow", light enough and cheap enough to be within the means of the average citizen, was the consensus of the meeting on postwar aviation in Texas and the Southwest, which was led by E. H. Jackson, secretary, Globe Aircraft Corporation, Fort Worth.

While plants will continue to make larger, heavier, and better-equipped planes, the flivver type will be the fastest selling machine on the market.

While opinions differed in some details of horsepower, carrying capacity, cruising speed, landing gear, range needed and landing speed, the thought was that the plane the general public will demand should be able to take off and land in a small space; be light, well constructed, fair speed but not fast, and costing under $1,500.

It was the belief of the meeting that some agency in each state should have the responsibility of laying out small landing fields and flight strips in practically every community. This is a prerequisite to the maximum use of airplanes for the same reasons that good roads preceded the building and the full use of the automobile of today. One maker of small type planes stated these fields need not be over one-third mile long and should have a grass runway about 100 feet wide.

Absenteeism Problems Aired

Absenteeism among aircraft company employes came in for a thorough round-table discussion in a panel led by Nate Molinarro of North American Aviation, Inc., Dallas.

—North American Aviation, Inc., Photo.

AFTER ANNUAL meeting at A. & M., the Texas Section of the Society of Automotive Engineers installed new officers. Harold Schwedes (left, above), manager of the Dallas division of North American Aviation, Inc., succeeded Allen Guiberson (right), executive vice president of the Guiberson Diesel Engine Co., Dallas, as chairman.

Causes of absenteeism, generally, were reduced to a lack of understanding of the importance of workers' jobs, lack of understanding of industry's problems, a mistaken attitude regarding company policies, some feeling that workers are about to be drafted and that they will spend available money for last flings, and lack of respect for supervisors.

One spokesman said his firm recently had fired 200 workers in two days for habitual absenteeism, while another stated a clause had been inserted in the union contract that any employe who fails to report a satisfactory excuse for his absence within forty-eight hours after leaving the job be dismissed.

Training of Engineers

H. J. Hansen of the Texas A. & M. staff led a discussion devoted to plastics and plywood developments. There are still lots of possibilities to be uncovered in the use of plywoods and plastics in aircraft construction. One of the greatest needs is for research to develop new uses and ways to use these materials. Some of the specific problems to solve in plywood and plastics use include: training skilled workers to handle these materials, making plywood moisture proof, finding an easy and inexpensive method of bonding plywood.

E. L. Williams, head of the Industrial Education Departmtnt, led a round-table discussion on all phases of vocational training, or training as done by individual plants for machine operators. It developed that some plants have full apprentice training and some do not. Details of primary mechanical instruction varied between the plants represented. Formerly it was held that it took four years to make a skilled mechanic, but under a definite, organized training program one can be turned out in about two years. The future pool of mechanics will be made up of women, boys between sixteen and seventeen, men thirty-eight and older, men classed as 4F, discharged service men and men classed as 3A with bonafide dependents. The leader kept the discussion in three main channels: pre-production training, supplementary training and supervisory training.

A session on College Level Training War and Postwar, was led by C. T. Reid, Douglas Aircraft Corp., Santa Monica, Calif. It was the opinion that colleges should teach students that the training they were getting was highly basic and that they would have to go through a period of specialization with industry. Reid outlined a plan for perpetuating ESMWT. His proposals are published in full elsewhere in this issue of SOUTHERN FLIGHT.

Public relations problems were discussed in a session attended by Captain Eugene Merrill of the Air Forces group, War Department Bureau of Public Relations, Washington; Lt. Myles Standish of the Midwest Procurement District headquarters, Wichita, Kans., and Lt. Phil Boyer of the Flying Training Command's headquarters, Fort Worth. The sessions were presided over by Andrew De Shong of North American Aviation, Inc., at Dallas, and William Sherrill of Consolidated Vultee Aircraft Corp., at Fort Worth.

At a session devoted to flight training, attended by more than fifty War Training Service co-ordinators and operators, Howard Barlow, head of aeronautical engineering at Texas A. & M., was re-elected chairman and C. K. Holsapple was re-elected secretary-treasurer of the Fourth Region Association of co-ordinators. A resolution strongly endorsing the National Aviation Training Association's policy of all-out co-operation in the War Training Service program's changes was unanimously approved by contractors and co-ordinators. Les Bowman of Ft. Worth, president, and C. R. Mooney of Kansas City and Washington, sec-

(Continued on page 44)

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WARTIME CONFERENCE

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retary, of NATA, spoke in behalf of the resolution.

John P. Morris and John P. Mifflin of CAA-WTS answered questions from operators and arranged for further discussions in Ft. Worth.

In other sessions, Lt. Commander Patrick Henry Winston, representing the Selective Service headquarters in Washington, conferred with personnel directors of aircraft plants, and Fred H. Lockwood of the Guiberson Diesel Engine Company of Dallas presided over a discussion centering on personnel procurement.

Among many notables in attendance was William T. Piper, president of the Piper Aircraft Company of Lock Haven, Pa. Introduced by George Haddaway, editor of SOUTHERN FLIGHT and co-chairman of the conference, Piper said the small plane manufacturers were "building many things in addition to the airplanes we pioneered."

Films showing aircraft production were shown and included one furnished by North American Aviation, Inc.

Those registered at the Conference were:

Clyde Adams, Guiberson Diesel Engine Co., Dallas, Tex.; Paul Allen, North Texas Agr. College, Arlington, Tex.; Chas. E. Ames, Brochsteins, Inc., Houston, Tex.; A. D. Anderson, Braniff Airways, Inc., Dallas, Tex.; F. L. Arceneaux, CAP, New Orleans, La.; Tom Ashley, Southern Flight, Dallas, Tex.; R. E. Atha, Mayor's Committee, Kansas City, Mo.; S. E. Attaway, Amarillo, Tex.; O. O. Baker, Baker & Sons Flying Service, Magnolia, Ark.; H. W. Barlow, A. & M. College, College Station, Tex.; Bill Barton, University of Texas, Austin, Tex.; Earle W. Berry, CAP, McGregor, Tex.; Lloyd G. Berryman, A. & M. College, College Station, Tex.; F. D. Bidlfike, Douglas Aircraft Co., Oklahoma City, Okla.; W. L. Black, CAP, El Paso, Tex.; B. P. Boehn, CAP, Houston, Tex.; A. J. Bommer, CAP, Dallas, Tex.; R. L. Bowen, Community Public Service, Ft. Worth, Tex.; Earl M. Bowler, U. S. Office Education, Dallas, Tex.; E. M. Bowman, Coordinator, Ft. Worth, Tex.; J. C. Bowman, University of Texas, Ft. Worth, Tex.; L. H. Bowman, Aircraft Sales Company, Ft. Worth, Tex.; O. E. Brogg, Douglas Aircraft Co., Oklahoma City, Okla.; E. Bridges, AAF, Ft. Worth, Tex.; I. S. Brochstein, Brochstein's, Inc., Houston, Tex.; C. F. Brockman, Guiberson Diesel Engine Co., Dallas, Tex.; H. W. Brown, University of Texas, Austin, Tex.

R. H. Brown, U. S. Army, Dallas, Tex.; R. R. Brown, CAP, El Dorado, Ark.; O. L. Bryan, North American Aviation, Dallas, Tex.; J. F. Buddington, North American Aviation, Dallas, Tex.; J. E. Burkholder, CAP, Dallas, Tex.; James L. Camp, CAP, Dallas, Tex.; R. J. Cardwell, Cardwell Flight Academy, Bryan, Tex.; Geo. B. Cash, CAP, Quilot, Ark.; Lt. Col. E. B. Cassidy, Randolph Field, Tex.; K. R. Cassou, Cliff Hyde Flying Service, Houston, Tex.; Jim Chambers, North American Aviation, Dallas, Tex.; Lt. Col. F. H. Chetlain, AC, Dallas, Tex.; M. F. Clark, Flight Control Command, Kelly Field, Tex.; W. H. Cobb, CAP, New Orleans, La.; R. H. Coleman, Smaller War Plants Corp., Ft. Worth, Tex.

T. E. Collins, Aviation Credit Corp., Love Field, Tex.; Ayers Compton, Braniff Airways, Inc., Dallas, Tex.; Chas. L. Convers, North American Aviation, Dallas, Tex.; Geo. W. Cox, Canyon, Tex.; Lillie F. Crenshaw, CAP, Bryan, Tex.; L. E. Crocker, CAP, Beaumont, Tex.; F. P. Crook, Douglas Aircraft Co., Oklahoma City, Okla.; Don Davis, WHB, Kansas City, Mo.; R. L. Davison, Aeronca Aircraft Corp., Middletown, Ohio; P. W. DeGood, Coleman Lamp & Stove Co., Wichita, Kan.; Andy DeShong, North American Aviation, Dallas, Tex.; H. A. DeShong, North American Aviation, N. Kansas City, Mo.; Hal C. Doremus, John Tarleton Agr. College, Stephenville, Tex.; V. L. Doughtie, University of Texas, Austin, Tex.; Ona Mae Eckuls, CAP, Bryan, Tex.; C. L. Eddleman, W. T. D. Flying Service, McCamey, Tex.; M. O. Eddleman, Airport, McCamey, Tex.; J. R. D. Eddy, Dir. Vocational Education, Austin, Tex.; T. L. Edwards, Highway Dept., Austin, Tex.

—Texas A. & M. Photo.

TOURING AERONCA representatives attended the Texas Conference in a body. Left to right (above) are C. E. Smith, R. L. Davison, Ned Kennedy and Pat Kennedy, all of Middletown, Ohio. Also with them was Irving Fields, public relations, of New York.

W. A. Ehrich, Jr., North American Aviation, Dallas, Tex.; F. W. Estill, Consolidated Vultee Aircraft Corp., Ft. Worth, Tex.; Roy Farrell, Singleton Field, Ft. Worth, Tex.; T. P. Faulconer, Consolidated Vultee Aircraft Corp., San Diego, Calif.; W. C. Fawcett, Kerrville Flying Service, Kerrville, Tex.; J. I. Fields, Aeronca Aircraft Corp., Middletown, Ohio; G. B. Forristall, Houston, Tex.; Van A. France, Consolidated Vultee Aircraft Corp., Ft. Worth, Tex.; S. L. Frost, Texas Forest Service, College Station, Tex.; Noah Fry, Elsa, Tex.; Perry R. Gage, Vega Aircraft Corp., No. Hollywood, Calif.; Edw. Garbacz, Central Flying Service, Little Rock, Ark.; P. O. Geoldie, McAllen, Tex.; L. R. Gigniliiat, ESMWT, Ft. Worth, Tex.; W. K. Glick, Texas Wesleyan College, Ft. Worth, Tex.; H. T. Godeke, Texas Teachers College, Lubbock, Tex.; J. M. Goodell, War Manpower Com., Beaumont, Tex.; Austin, Goodwin, Guiberson Diesel Engine Co., Dallas, Tex.; Ellis Gotcher, Municipal Airport, Houston, Tex.; M. A. Gossett, CAP, McGregor, Tex.; Allen Guiberson, Guiberson Diesel Engine Co., Dallas, Tex.; L. E. Guillot, Assoc. Aviation Under., Dallas, Tex.; R. P. Guinn, Coleman Lamp & Stove Co., Wichita, Kan.

Geo. Haddaway, CAP, Beaumont, Tex.; T. M. Hammond, CAA-WTS, Kerrville, Tex.; F. E. Hargiss, Lockheed Aircraft Corp., Dallas, Tex.; H. R. Harold, Tonkawa, Okla.; J. C. Harrison, Hoover Bros., Inc., Temple, Tex.; Lt. R. C. Hausinger, Mission, Tex.; D. C. Havens, Magnaflux Corp., Dallas, Tex.; S. L. Haycraft, WPB, Dallas, Tex.; D. R. Hayes, CAP, Little Rock, Ark.; R. P. Hayes, CAP, Little Rock, Ark.; H. A. Helms, Reed Roller Bit Co., Houston, Tex.; W. R. Hetherington, Guiberson Diesel Engine Co., Dallas, Tex.; Lt. Henry Heymann, New Orleans, La.; H. M. Hill, Turco Products, Inc., Houston, Tex.; R. E. Hinkel, TWA, Kansas City, Mo.; Hoffman, North American Aviation, Dallas, Tex.; C. K. Holsapple, Texas Christian Univ., Ft. Worth, Tex.; Coulter Hoppess, A. & M. College, College Station, Tex.; W. R. Horsley, A. & M. College, College Station, Tex.; C. M. Hudgins, Guiberson Diesel Engine Co., Dallas, Tex.; M. R. Hudnall, Guiberson Diesel Engine Co., Dallas, Tex.; Jack Hughes, Abilene Aviation School, Abilene, Tex.; H. L. Hutchinson, Keystone Tool & Supply Co., Houston, Tex.; Cliff Hyde, Cliff Hyde Flying Service, Houston, Tex.; Ralph Immel, Parker App. Co., Dallas, Tex.

R. B. Jackman, North American Aviation, Corp., Ft. Worth, Tex.; E. H. Jackson, Globe Aircraft Corp., Ft. Worth, Tex; H. H. James, DuPont Co., Dallas, Tex.; J. G. Jameson, CAP, New Orleans, La.; A. E. Jastram, CAP, New Orleans, La.; F. W. Johnson, CAA, Ft. Worth, Tex.; R H. Johnston, CAP, Wharton, Tex.; J. L. Johnson, Douglas Aircraft Co., Tulsa, Okla.; G. J. Kalb, Precision Inspection Service, Houston, Tex.; P. W. Keating, Aeronca Aircraft Corp., Middletown, Ohio; E. P. Kennedy, Aeronca Aircraft Corp., Middletown, Ohio; John A. Kirschko, Houston Spring Co., San Antonio, Tex.; P. B. Koonce, Municipal Airport, Houston, Tex.; Roland A. Laird, Chamber of Commerce, Houston, Tex.; P. R. Lampley, Retail Furniture, El Campo, Tex.; J. A. Lapham, Consolidated Vultee Aircraft, Ft. Worth, Tex.; A. W. Larkin, Av. Comm. Chamber of Commerce, Houston, Tex.; R. J. Larsen, CAA, Houston, Tex.; P. A. Lawrence, Dept. of Health, Austin, Tex.; Wm. E. Lind, Guiberson Diesel Engine Co., Dallas, Tex.

J. P. Lindsay, CAP, McAllen, Tex.; Fred H. Lockwood, Guiberson Diesel Engine Co., Dallas, Tex.; R. W. Logan, Braniff Airways, Inc., Dallas, Tex.; M. Margo, Globe Aircraft Co., Ft. Worth, Tex.; L. H. Matthes, General Electric Co., Beaumont, Tex.; M. W. Melton, CAP, Trumann, Ark.; Carl H. Meyer, WPB, Dallas, Tex.; John P. Mifflin, CAA, Washington, D. C.; J. J. Milberger, National Youth Adm., Austin, Tex.; D. L. Miller, North American Aviation, Dallas, Tex.; D. P. Miller, Consolidated Vultee Aircraft, Ft. Worth, Tex.; Wm. B. Mims, Jr., Lockheed Aircraft Corp., Dallas, Tex.; R. E. Mitchell, Tri-State Sales Co., Ft. Smith, Ark.; Nate Molinarro, North American Aviation, Dallas, Tex.; H. F. Moller, Reed Roller Bit Co., Houston, Tex.; C. R. Mooney, NATA, Washington, D. C.; W. W. Moore, Cessna Aircraft, Wichita, Kans.; Don H. Morris, Abilene Christian College, Abilene, Tex.; John P. Morris, CAA, Washington, D. C.; W. E. Mueller, CAP, El Paso, Tex.; R. C. Murray, Chamber of Commerce, Kansas City, Kans.; Don McCaur, Air Associates, Inc., Dallas, Tex.

R. G. McDaniel, CAP, Corpus Christi, Tex.; F. R. McKnight, Dallas News, Dallas, Tex.; James MacKrell, CAP, Little Rock, Ark.; E. E. McQuillen, A. & M. College, College Station, Tex.; Lt. Col. B. E. Nowotny, Randolph Field, Tex.; Floyd O'Neal, Ralph E. Fair, Inc., Mission, Tex.; Major C. Patterson, Dallas, Tex.; A. H. Peterson, CAP, Alice, Tex.; Ross A. Peterson, North American Aviation, Dallas, Tex.; F. C. Pettitt, Guiberson Diesel Engine Co., Dallas, Tex.; G. R. Pickard, CAP, Rosenberg, Tex.; W. T. Piper, Piper Aircraft, Lock Haven, Pa.; W. A. Prewitt, Jr., CAP, New Orleans, La.; Robert Ragsdale, Ragsdale Flying Service, Austin, Tex.; J. D. Redding, SAE, New York, N. Y.; H. H. Reed, CAP, Dallas, Tex.; C. T. Reid, Douglas Aircraft Corp., Santa Monica, Calif.; J. W. Richardson, Rohm & Haas Co., Philadelphia, Pa.; G. W. Robinson, CAP, New Orleans, La.; Mary Royse, CAP, Dallas, Tex.; R. L. Schmidt, Highway Dept., Austin, Tex.; John D. Scruggs, Guiberson Diesel Engine Co., Dallas, Tex.; H. K. Sellers, Mustang Aviation School, Dallas, Tex.; Pvt. Les Seversen, AAF, New Orleans, La.

L. G. Shelby, Aircraft Steel & Supply, Dallas, Tex.; Harry A. Sheridan, Guiberson Diesel Engine Co., Dallas, Tex.; Bill Sherrill, Consolidated Vultee, Ft. Worth, Tex.; E. J. Schetler, Consolidated Vultee, Nashville, Tenn.; R. T. Shiels, General Electric Co., Dallas, Tex.; Bob Singleton, Singleton Field, Ft. Worth, Tex.; C. E. Smith, Aeronca Aircraft, Middletown, Ohio; H. D. Smith, Precision Aero. Corp., Houston, Tex.; H. N. Smith, Guiberson Diesel Engine Co., Dallas, Tex.; R. J. Spremich, CAP, New Orleans, La.; P. E. Spruill, U. S. Employment Service, Austin, Tex.; Lt. Myles Standish, U. S. Army Air Corps, Wichita, Kans.; David W. Starr, Southern Methodist Univ., Dallas, Tex.; Virgil Starr, Guiberson Diesel Engine Co., Dallas, Tex.; Terry Stephenson, Glenn L. Martin Co., Omaha, Nebr.; M. C. Stone, North Texas Agr. College, Arlington, Tex.; J. B. Story, Globe Aircraft Co., Ft. Worth, Tex.;

Wm. B. Stout, Consolidated Vultee, Dearborn, Mich.; W. E. Street, A. & M. College, College Station, Tex.; R. N. Swanson, Curtiss-Wright, St. Louis, Mo.; R. L. Taylor, CAP, Little Rock, Ark.; J. P. Terrell, Temple Granite Works, Temple, Tex.; F. A. Thahold, Guiberson Diesel Engine Co., Dallas, Tex.; J. G. H. Thompson, A. & M. College, College Station, Tex.; A. O. Thrane, McMurry College, Abilene, Tex.; T. F. Wallis, Allen Military Academy, Bryan, Tex.; W. T. Walton, Hardin-Simmons University, Abilene, Tex.; W. A. Wargo, AAF, Wichita, Kan.; C. B. Wasson, Muskogee, Okla.; J. A. Wasson, Aero Ins. Underwriters, Dallas, Tex.; J. C. Webb, Lilly Ice Cream, Bryan, Tex.; H. Whiteside, El Campo, Tex.; J. A. Williams, Republic Aviation, Dallas, Tex.; Weldon Williams, Air Associates, Dallas, Tex.; H. H. Willis, Lockheed Aircraft, Dallas, Tex.; A. B. Willson, Doall Texas Co., Houston, Tex.; Lt. Commander P. H. Winston, Selective Service System, Washington, D. C.; J. L. Wright, CAP, San Antonio, Tex.; R. D. Wright, CAP, Wharton, Tex.

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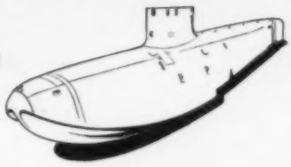
to build seaplane floats  *by the thousands*

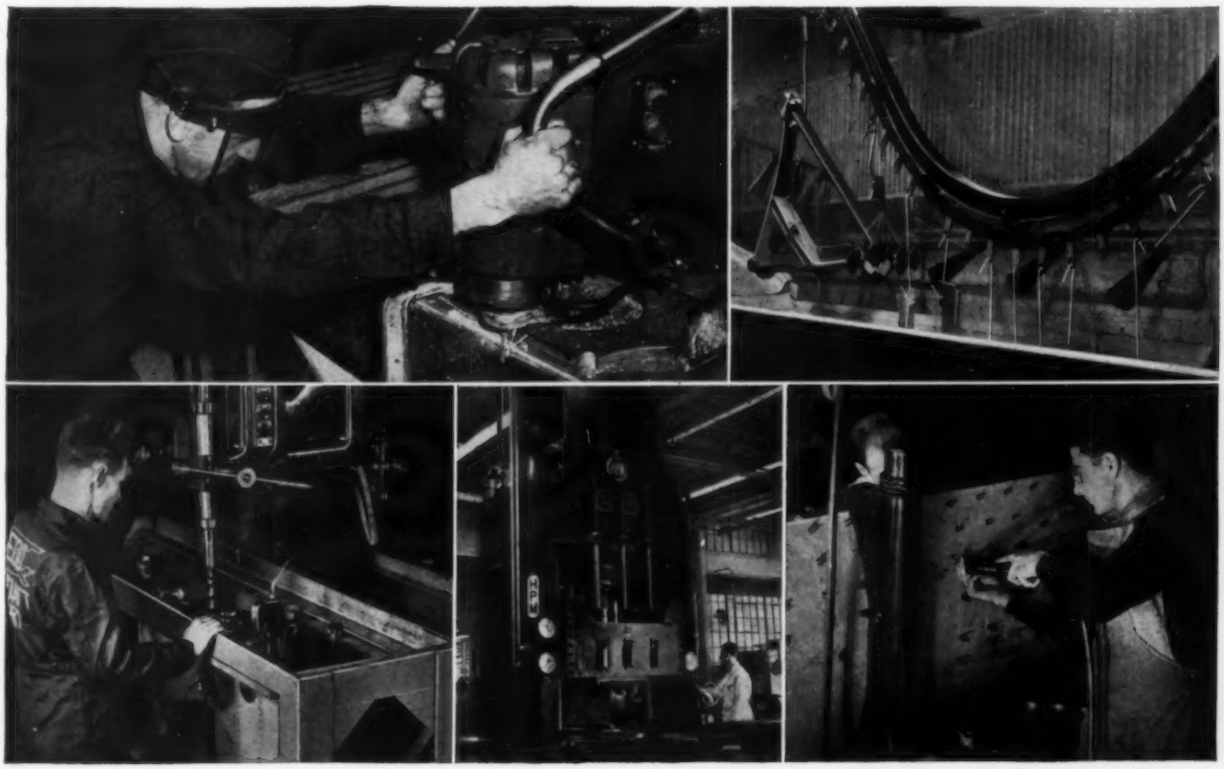
When, early in the war, our Government was confronted with the need for thousands of seaplane floats, Edo's experience of 18 years as specialists in building all-metal float gear became a national asset of vital importance.

Assigned to the task of turning out these lightweight, intricate, streamlined structures in impressive numbers, Edo's success in planning and carrying out a tremendously expanded production program has won the Army-Navy "E" award.

The great Edo plant which produces the float gear for our Navy and Army Air Forces is one of the most modern and completely equipped in the war industry. 1,000 ton presses, at one stroke, form flat metal sheets into accurate, precise shapes. Chain conveyors, delivering parts to the Anodic Tanks, Inspection, Drying Ovens, Paint Dip Tanks, Final Inspection and storage, reduce seven handlings to one! "Swing arm" routing machines cut stacks of irregular shaped parts to exact pattern. Pedestals which attach the float to the airplane's fuselage are jig drilled to a degree of accuracy which assures absolute interchangeability. Sub-assemblies are held in proper shape by vertical supports during drilling, countersinking and flush riveting, enabling two-man teams to complete over 2,000 riveting operations in a day!

These processes, all illustrated here, give but a glimpse of the modern methods and machines which enable Edo to fulfill exacting schedules in the production of the world's finest seaplane floats for our armed forces.

EDO AIRCRAFT CORPORATION, 416 SECOND STREET, COLLEGE POINT, L. I., N. Y.



★ EDO FLOAT GEAR ★

SERVES THE UNITED NATIONS

By C. T. REID
Staff Engineer
Douglas Aircraft Co., Inc.

A talk given at Texas Aviation Conference, May 6-8.

College Level Training ---War and Postwar

Short-term training for aviation engineers has proved most successful in programs closely co-ordinated with the industry. This frank discussion explains why—and suggests far-reaching improvements.

THE other day a Princeton student left class to go to the washroom and missed his entire sophomore year. At least it was so reported in the Reader's Digest. Be that as it may, the war certainly has brought about acceleration of engineering training. It has brought other innovations, too. Many of them are related to the ESMWT program, Engineering-Science-Management War Training.

ESMWT has covered a wide variety of training. In one type of its activity there have been full-time college courses with balanced curricula, designed to convert technical men from older industries to new ones for the war. In another type of activity there have been single subjects taught, a few hours at a time, once or twice a week, to help people already employed in war work rise to higher levels of responsibility. We shall here confine our attention to this latter type of ESMWT course, dealing with a single subject at a time, because it has helped industry the most. Some of the reasons why it has done the best job are:

(1) It has met an immediate need.
(2) It has followed a well-defined path toward application to the job.
(3) Its quality has been very high.

Industry judges the quality by utility value. The principal reason the utility value is high is this industry itself has contributed heavily to these courses. Let us see just what industry has been able to contribute.

How Industry Serves

One thing is course content. The best ESMWT courses have been those teaching details suggested by industry itself. Another thing is the instructors. These best courses have generally been taught by men loaned from industry. A third thing is reference material. Utility value comes in direct proportion to use of up-to-the-minute industrial practices as text material.

Let us see what the colleges have meanwhile been able to contribute. For one thing, the facilities to conduct the study. Industry seldom has available any suitable classrooms or laboratories, or the furnishings for them. Another thing is the administrative staff. Keeping track of the necessary paper work is no small task in many cases. A third thing is the teaching "know how". Many of the industrial men assigned to teach have to be helped to develop good teaching technique. The present audience is well aware that knowing a job and being able to pass the knowledge along to someone else are two very different things.

I quote the recent remarks of Dean Case, Director of ESMWT in the United States Office of Education: "Men from industry have brought a wealth of practical experience to bear on the planning of course content, but extensive coaching instruction and supervision have been required in many instances to prepare these men to handle classes at the college level and to insure that acceptable standards of instruction were maintained. The heavily burdened faculties deserve great credit for the will and efficiency with which they have undertaken this additional task of training and supervision."

A fourth thing contributed by the colleges is the financial means. These have, of course, been provided with federal aid. Of the four things contributed by the colleges, the only one that is new with respect to familiar college activity is the last. This paying of all the bills so that a course can be tuition-free is a fine thing, because it brings the training to people sorted out by need and industrial opportunity, rather than by family financial position. However, all the rest of the things contributed by the colleges, facilities, administrative staff and teaching "know how", are things the colleges have always contributed. The other outstanding new advantages of these courses must be derived from the part industry has contributed. Namely: the curriculum, the faculty and texts.

Let us look at the courses closely and see just what they are like. One single subject is taught to a picked group of students who are ready to make use of that subject. Many different subjects are taught to many groups, but each in a complete separate, short course. The groups present no uniformity of scholastic background. Training is offered at a great number of levels to individuals of various levels of intelligence and various capabilities. Each student is reached at his own level by simply making sure he doesn't get included in the wrong group. Mr. A is ready for graduate work, like Elastic Analysis of Structures. Mr. B. needs something at under-graduate level, perhaps Strength of Materials. He isn't ready to take a higher level of work. Mr. C has never had any college training but is a promising high school graduate and is ready for his first college level technical study, perhaps something like Descriptive Geometry. We don't try to make a Structures Expert of Mr. C, or even Mr. B, at the present time. We are satisfied to make a Draftsman of Mr. C. We're satisfied to make a Strength Checker of Mr. B, for the present. Only Mr. A is ready to be made an expert in Elastic Analysis. Each is reached at his own level. Each is given just what he is ready to put to use. Then other things are made available to him for further advancement.

It is significant that industry's need is met at all levels immediately. The total of studies of all groups produces simultaneously all the required knowledge of every subject from the most elementary to the most advanced.

It therefore appears that all of our technical employes can, through single unit studies, rise as high in the Engineering profession as their own ca-

(Continued on page 48)

☆ Six ways to Boost Production with no Increase in Manpower

. . . as shown by Glenn L. Martin Records

Go After Subcontractors: Don't wait for subcontractors to come to you. Martin keeps 40 men of its Procurement Dept. on the road, lining up subcontractors, helping them convert. Result: firms that made bottle-caps are turning out wingspars . . . awnings become parachute slings . . . milk cans become exhaust stacks. Today, 30% of all Martin work is subcontracted, more fighting planes like those shown above, are being produced.

Encourage Workers' Suggestions: Martin gives cash awards, silver Merit Award pins, membership in the company's Order of the Purple Martin, and a share in proceeds if patentable, for suggestions to speed up production. Many short-cuts, new methods add up to big increases in Martin output. Here Joe Holthaus, Martin worker, studies check received for devising a tool that saves 40% of the time previously devoted to one operation.

Cut Your Accident Rate: Whether minor injuries or serious accidents, they cut manpower, slow production. Martin employs safety engineers, organizes workers' safety committees, supplies movies, lectures, special instructions, and numerous posters. In spite of many new workers, Martin accident rate is well below national figure, steadily decreasing. Here a Martin worker displays a "gas mask," protection against toxic fumes from self-sealing fuel tanks.

☆

Encourage Ride-Sharing: Poor transportation facilities may cause workers to quit or be periodically late. Moreover, there is less chance of absenteeism if other workers call for the potential absentee. Martin set a national record of 4.5 passengers for each car. Martin traffic control and

parking facilities have ended pedestrian accidents, cut vehicular accidents by 60%.

☆

Watch That Morale: Posters, organized recreation, good lunches, modern working conditions, houseorgan, merit awards, all raise Martin morale. But little things count, too. Experimentally, Martin found that red work benches made workers short-tempered, blue induced sleepiness, green nausea. A neutral tint upped production. Attractive slacks, called Martinalls, aid feminine morale. Special advisors help solve personal problems. Absenteeism has been reduced far below national average by special services and facilities set up to aid employees. Below, Family Day, with Martin families guests of company.

Stay in the Scrap: Organized scrap collection in Martin plants helps prevent work slowdown through lack of raw materials. Enough material is salvaged from building of 2 Martin bombers to build a third. Many imperfect parts, instead of being scrapped and labor wasted, are adapted for other jobs. Martin invented mechanical rivet-sorter to sort thousands of dropped rivets, saves endless man-hours of hand sorting. Above, Martin scrap going back to the mills for re-use.

☆

Martin findings on any of the above production aids available upon request by plants engaged in war work. Write: THE GLENN L. MARTIN COMPANY, BALTIMORE, MD., U. S. A.

Member: Aircraft War Production Council, East Coast, Inc.

☆

Martin
AIRCRAFT

Builders of Dependable Aircraft Since 1909

COLLEGE LEVEL TRAINING

(Continued from page 46)

pacities permit. Well, this sounds like a fine thing to have happen. What will it take to perpetuate this happy state of opportunity?

Why Training Is Practical

To begin with there should be some permanent plan of subsidy of the training so that the opportunity will not be limited by the pocket book. Under the Smith-Hughes and George-Deen Acts, Federal reimbursement to local public schools has made tuition-free trade training possible for the last twenty years. Many an ordinary high school does an excellent job of this trade training, administering it through its regular staff and utilizing its regular facilities. A similar reimbursement plan for colleges and universities should make it a simple matter to offer extension courses tuition free. Before the war, the extension divisions of some of the universities were offering to our people, courses differing from these better ESMWT courses, in one particular only. There was a stiff tuition fee. The things that make a good useful extension course, of the prewar kind, and those that make a good useful ESMWT course, are one and the same. This is what they are:

Class established at industry's instigation for a definite group of people who have a definite need—Time, place and all arrangements convenient to the industry—Experience at teaching going hand-in-hand with experience at applying in industry that which is taught.

What a fine thing it will be if the boys can come home from the war to opportunities, assuring every American a chance to develop to his own full capacity, the technical knowledge demanded by his job!

Since the new features that make the study courses so fine come largely from industry, it is of greatest importance that industry continue to favor them, support them and strive hard to make them successful. Industry *must* furnish the details of the course content. Otherwise, the training won't measure up to industry's needs, or keep pace with industry's rapid advancement. Industry *must* provide frequent periods of employment for all instructors in Engineering subjects. This is by all odds the best way to maintain a teaching staff expert in both theory and practice. Industry *must* make available its reference and procedure manuals and sample problems from its new experiences. Very few specialization text books and still fewer texts of fundamentals are able to give enough practical examples to cinch the learning process the way it can be cinched when emphasis is placed upon application to use.

Some people have expressed the fear that this philosophy may produce substandard courses, belonging more properly to a trade school than a college.

It is true that quality control is of paramount importance. The administrative authorities should be encouraged to establish and maintain adequate safeguards. The standard of qualifications of the instructor may be held just as high as any university wishes. Scrutiny of course content to assure college level and college quality may be most thorough. Every item must stand trial as to its importance to the Engineering profession. Entrance examinations and completion examinations for each course may be just as stiff as any curriculum board desires. The resulting work will then of necessity be of the highest order of value. There should be no question of eligibility for full college credit.

Without waiting for a new permanent plan, why don't we establish such quality control as this for the ESMWT courses now? In this way they could bring credit toward a college degree.

Advantages of 3-Yr. Course

It is a well-known fact that many a college student isn't sure what career he wishes to follow. Why shouldn't we use courses like those here discussed to help anyone complete his college work, *after* he finds his spot in industry, and without losing his assignment to go back to full-time studying?

The criticism has been made that covering a whole four-year college course in independent single units of study might overdo practical emphasis and turn engineering education into mere job training. There should be no danger of this if the plan is correctly understood and administered. Everything in the course for a degree would be included. There should be more emphasis than ever upon the fundamentals of mathematics and science. There would be included all the cultural development which distinguishes a professional man from a tradesman.

With industry stating what courses are essential to its need, and the university naming those courses which must be included for a degree, all advantages are retained. There is the firm foundation, broad general training, cultural development, and productive work specialization. With an engineering college in an industrial area, operating as here conceived, it would be possible for a student to take all or any part of the work for his engineering degree in bite size, subject by subject, outside of working hours. Meanwhile, another student might elect to take all or any part as his main time activity. The only difference would be in the number of credits possible to carry at one time, and consequently, in the elapsed time required to graduate.

Let's consider for a moment this question of time required to graduate. It took a war to jar us loose from the folly of wasting one-fourth of the study year each summer. Our standard four-year curriculum is now completed in three years. The so-called accelerated programs with non-essentials left out, run still less time. Putting the non-essentials (or something better than the old ones) back in after the war, we can still give a college degree in three years instead of four, if anyone insists upon going straight through. We won't advise that because we think it will be better for the full-day student to spend intermittent quarters in industry, even if he has already settled in his mind which line he wishes to train for. The old school year of nine months is readily divided into trimesters instead of semesters. At least one of our great institutes of technology has always operated that way. Having summer studies simply gives four terms in a year instead of three, and reaches the old four-year total of twelve terms at the end of the third year.

Let us remember that not only the students need time in industry interspersed with their college time. It is even more important for the instructors—every instructor of an engineering subject.

Let us suppose there are four quarters of twelve weeks each. This leaves one week between each two quarters to round out the full calendar year. Ideally, every twelve-week credit unit should be taught every quarter so that full-day students could start and drop out for industrial work experience at will, and so that those working a full day and carrying just a light course on the side, could get the next subject when they are ready for it without waiting further around the calendar. Obviously, this has serious practical limitations and must result in a compromise. However, the way is pointed toward a plan that would do much to conserve for the peacetime

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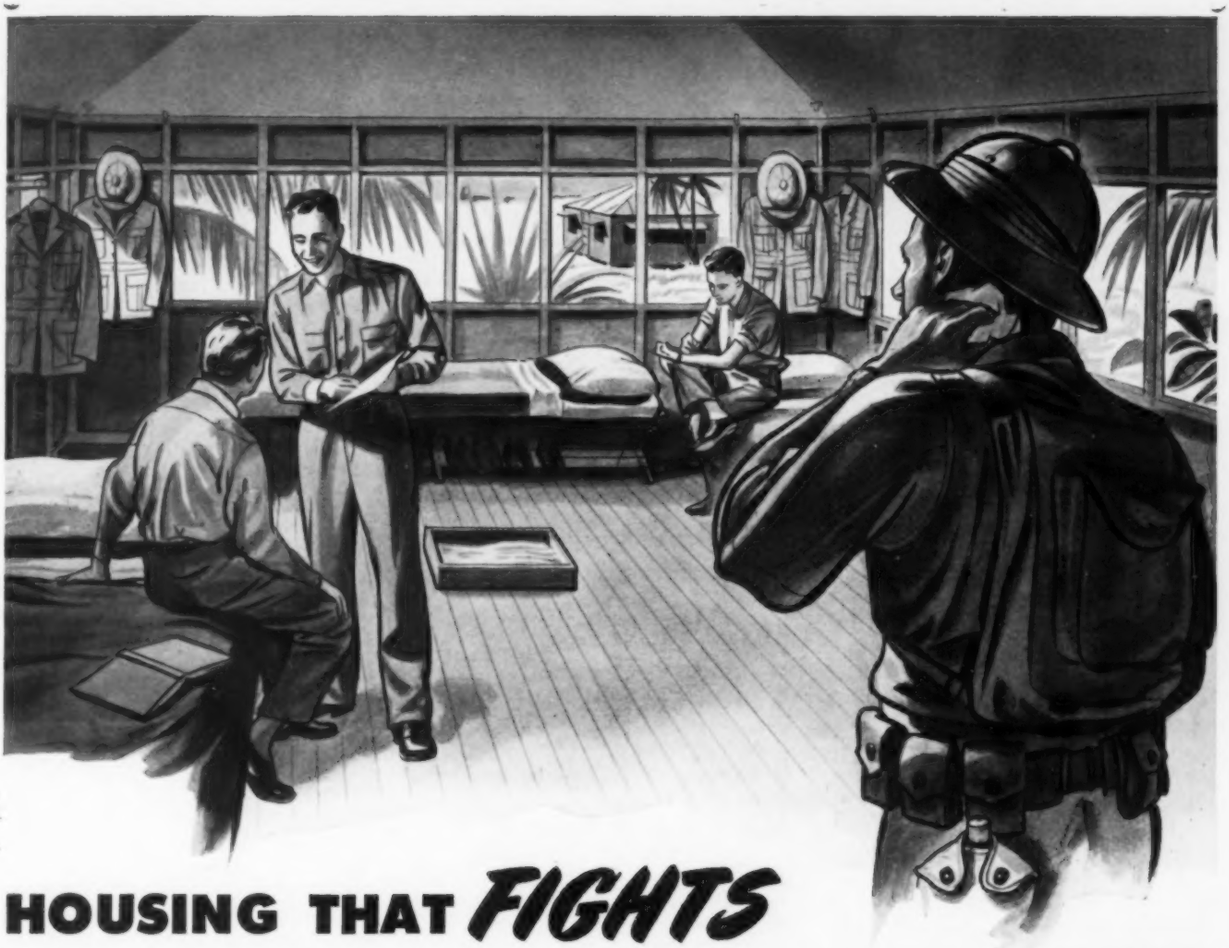


HOUSING THAT *FIGHTS* THE SUMMER HEAT ENEMY

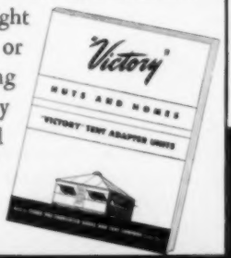
In summer as in winter, from the South Pacific Islands to North Africa, Victory Housing contributes vitally to victorious war—housing our fighting forces and war workers *well, efficiently* and *economically.* At airfields as in camps and housing of civilians, it serves well.

Air-Space insulation, so important in the hot months ahead—*uniquely* designed, is built into all Victory Housing. In summer, cooling air circulates freely; in winter, the same space provides insulation against cold, but ventilation is not impeded.

This is but one feature of Victory Housing, now available to the armed forces and ideal for CAP and other airfields*, as well as for housing of war workers. Victory Housing is fully pre-fabricated, demountable and portable, quickly erected at low cost. Victory Housing is extremely flexible and versatile; units may be added quickly, expanding the capacity of Victory Housing already standing.

** Subject to government regulations.*

OFFICERS AND CAA OFFICIALS: If your duties involve housing of personnel, ask us for a complete descriptive booklet giving details of Victory Huts and Homes. They are fully transportable and easily shipped—five to a truck and ten to a freight car. A letter or wire will bring you "Victory Huts and Homes."



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THE Sky's the Limit

BY BILL GREEN

America needs fast-moving mail . . . Let's carry all first class matter by air . . . Disgusting experiences with the railroads . . . Trains are better equipped for freight than passengers or mail . . . Tribute to test pilots.

All Mail to Be Air Mail

THE CAA has been studying the notion of possibly transporting all mail by air—as soon after the war as the airlines will be able to handle it. We are heartily in favor. In the first place, when people write letters, they do it because they want to communicate some information, which, to them, is important—and they want immediate results. The fact that we are accustomed to the slowness of railway mail service, makes no difference. Most of us have been driven to air mail—and are more than willing to pay a premium for such service.

It is likely that all mail can be hauled by air at about the same rates that the railroads are hauling it. The post office department has always operated at a considerable deficit—and if the rates cannot be adjusted on the basis of cost plus a little profit to the airlines, based on the poundage and mileage, and still retain the regular three-cent postage rates, then it seems to us that a small subsidy would be in order. The manifold advantages of air mail speed would increase the annual income for the country far in excess of the cost. (Just consider this idea: Many people have not thought that if they could do two years' business in the space of one year—they could likely do it with the same personnel, or not much increase, and they would make a very nice profit. Almost any company operating at a loss would do a nice profitable business with an increase in business. Such an increase would result if all the processes of ordering, selling, buying, and general correspondence were speeded up. Think it over.)

We do not feel sorry for the poor railroads. Although they are running their trains during this war, and hauling a lot of stuff, they have never recovered from their stuffy attitude gained back in the early twenties. They still will not try to give real service. They don't have their hearts in the business.

Passengers by Air—Freight by Rail

As an example, we were on a regular train from New York to St. Louis the other day. There were no Pullman spaces available, so we started out in a chair car. The car was dirty—although we saw the personnel standing around who were supposed to clean it up. The Pullman conductor promised to call us at Harrisburg where he hoped to have some spaces on the cars from Washington. Instead, at Harrisburg they took off all Pullman cars, put them on a special train—which ran on ahead (on schedule). The next morning the lavatories had no water, in five cars there were no towels, and no soap. In the car where we were there were no drinking cups. It was impossible to get into the dining car. The train was two and a half hours late—and we missed our connection. The train people expressed no concern nor interest in any of these things.

At St. Louis, after missing our train we called the airlines and found a space available—which we really snapped up. The ship was full, took off on schedule, arrived on schedule, and was clean, well equipped, and the crew took good care of us. Our net impression is that the railroads should handle freight—they are well set up physically and mentally to handle inanimate objects. The airlines should be helped and encouraged to handle an increasing amount of mail and passenger transport. They have merited it by their efforts and consideration. Anyway, that is the only way to travel. There never was a train that didn't get overcrowded at times. The airlines are never overcrowded. The many little extra services that airlines provide, such as fine free meals, free late magazines, stewardess service, maps, scenery, clean air, air-conditioning, etc., are important and healthful. That, added to the saving in time, adds to the joys of life.

Modern Test Pilots

The other day we went on a little jaunt to the West Coast and saw some of our friends who have been testing and delivering warplanes for the last year or two. They were lounging around in a beautiful Spanish type ranch house, with all the comforts of home. In the parlor they had a beautiful Link Trainer set up and all the boys *have* to take a couple of hours Link per month—with instructor furnished free. They get pretty fair salaries, as things go — and have traveled from one end of the place to the other. They have put in more time on airline return trips than they have flown.

Seems they are flying four vastly different types of airplanes, including two of the fastest and hardest hitting jobs there are. One of their delivery trips from the factory to another city requires them six minutes from ground to ground. Takes forty minutes to fly back on the airline—two hours in a car and three hours on the bus. It is reported that one of the fellows didn't get his plane pointed the right way and landed in Denver before he could get it turned around. Anyway, the main feature that interested us was this: Most people have thought that test piloting was a helter-skelter proposition and that all test pilots get theirs sooner or later. Well, thousands of airplanes have been delivered by that bunch of fellows without the loss of a life or the destruction of an aircraft. Some of the planes were destroyed after they were delivered—by other pilots. But the thing has been admirably conducted — and the job has been done with precision and dispatch. We suspect civilian testing at many other large plants has been done with equally good records. When it is possible to release all details of this business we believe it will be one of

the brightest records of civilian participation in the war.

Fact is, these boys still need additional test pilots. You should have a commercial license, and a lot of time on several types of ships, and a lot of cross-country work. If they accept you, it might be necessary for you to go at first as co-pilot until such time as you had qualified and checked out on all the types of equipment being flown. Average age of pilots there was about forty years. If you are interested in a job of that sort, it will pay you better than you are probably accustomed — and the work is tremendously interesting. We saw licenses endorsed from 0 to 12,000 horsepower. If you were to buy that time with your own money you would need to have a half interest in the Denver Mint. When one envisions the flying possibilities after this war — and thinks about having such a ticket stuck back in the pocket somewhere — it looks more like it might have possibilities.

FIRE PROTECTION

(Continued from page 39)

types of fires. At these demonstrations, alternate members of the fire brigade should be permitted to operate the fire extinguishers themselves. Only in this way can they become familiar with the proper operation of equipment. This will eliminate guessing and fumbling with fire extinguishers in the case of an actual fire when seconds are precious. In addition to the instruction of members of the fire brigades, written instructions should be circulated among all hangar and shop personnel, describing the proper use and operation of fire extinguishers. Any individual will then be able to go into action in case of fire, pending the arrival of members of the fire brigade.

All these fire fighting instructions are worthwhile and will pay good dividends. However, they also have a tendency to make the employes feel self-sufficient with the result that no one will think of calling in the city fire department. This failing can be remedied by the appointment of individuals in all areas whose sole duty in case of fire will be to call the fire department. These individuals, known as alarm box runner, should then await the arrival of the fire department and direct them to the fire. A good local alarm system with fire alarm boxes located throughout the various buildings is essential. All employes must be impressed with the importance of sounding an alarm upon discovering a fire, no matter how small. In this way full advantage can be taken of the local fire brigades.

Equipment, tools and machinery must be carefully selected and maintained. Only properly protected and underwriters' approved type of automotive equipment should be used in a hangar. The small gasoline-engine-driven tractors, used for towing and moving airplanes, should have protected ignition systems, special air intakes and approved mufflers to eliminate exhaust of gasoline fumes and sparks. Under no condition should gasoline tank trucks or unprotected automotive equipment be admitted to a hangar. Portable electric tools, drills, etc., should be properly grounded. Special attention should be given to portable lamps and floodlights used in hangars, shops, on the ramps and in airplane interiors. All portable lamps should be vapor proof and of rugged construction. Extension cords must be strong and well insulated.

Assuming that all the aforementioned recommendations have been incorporated in the planning, construction and equipping of an airplane maintenance and overhaul base, it will also be necessary to maintain these high standards. This requires a large and competent crew of inspectors, maintenance and repair men.

Sprinkler systems must be frequently inspected and tested. All fire fighting equipment must be inspected periodically and maintained. An empty or defective fire extinguisher is worse than none. Electric appliances, motors, tools, machinery and portable drills and lamps require frequent systematic inspection and maintenance. Only by such precautions can the probable causes of fire be eliminated. The possible fire hazards are so numerous and new problems are so frequent that they require the attention of a full-time, competent, safety engineer.

Large fires at airplane maintenance and overhaul bases can be eliminated. Incorporation of the aforementioned provisions, strict adherence to codes and underwriters regulations, and the use of good common sense will eliminate such large fires and also assure that small fires will not turn into large and destructive conflagrations.

"SMILIN' JACK"

(Continued from page 23)

always coming from India or going to Africa or China, they meet lots of nice people and bring back plenty of good stories and ideas.

He does much of his work at night and much of it at fever pitch. A session over the drawing board often lasts ten or twelve hours with an occasional break for a cup of coffee. One of the most recent additions to the studio equipment is a swell new swivel chair with floating power, adjustable stabilizer, flaps, slots and all the gadgets that go to make a perfect working seat. Zack says it will add ten years to his life, but it'll probably only add ten inches to the spread when he reaches the mid-way mark.

No Pantie-Waist

Years ago, before we knew him, Zack may have been a Sunday pilot, but today he's no more a pantie-waist than Smilin' Jack, when it comes to flying. He has about 1,000 hours in his log, many of them in the often-dirty weather of the Coastal Patrol, theater of operations. Not long ago his ship swallowed a valve and almost made him a member of the Duck Club. He managed to make the beach and found a very handy airport under construction within stretching distance, so he set the thing down in the usual way.

Lest he be taken for a paragon of virtue and efficiency, we might add a few of his shortcomings. In the old First Air Squadron, Florida Defense Force, which held sway at West Palm Beach long before Pearl Harbor and in the many days of the CAP, Zack tries and tries but has never learned to drill. He was born in Hickory, Oklahoma, Indian territory then, and has a lope that could only come from clod-hopping. He knows it, admits it freely, and hides when there's a brass-hat inspection so he doesn't disgrace the outfit. But like everything else about the guy, that lope does cover ground.

He'll sit up half the night at a party drawing Cindy on Short-Snorter bills or making special drawings for some dreamy-eyed admirer—and miss the party goings-on completely.

If his eyes and his arteries hold out, Smilin' Zack will have a personal half of his 12,000,000 fans before many years are out and if his record proves anything, at least 11,999,997 of these will be his true friends.

ATTENTION!

If you live in a city that has been divided into mail delivery zones, please send us the number of your zone with your address as soon as possible. This will expedite delivery of your magazine and any other mail from this office.

SOUTHERN FLIGHT

P. O. Box 750, Dallas (1), Texas

COLLEGE LEVEL TRAINING

(Continued from page 48)

era, the advantages gained in engineering training in the war.

Some Recent Proposals

Wild as these proposals may sound, in the light of college education administrative plans with which we are familiar, they are less extraordinary than some others recently made. I quote Channing R. Dooley, the Director of Training-Within-Industry for the War Manpower Commission, under date of March 8, 1943. "The schools not only need to know what industry wants taught, but they need help in how to teach. They dwell too much on understanding, and not enough on doing. They have lost the art of teaching through the fingers, and worship mere brain power. Students need both—well co-ordinated, and personally, I believe *doing* comes first, and understanding *after*."

Here is another quotation. These remarks are by Captain J. Laurence Pritchard, Secretary of the Royal Aeronautical Society. I quote from his article in the March 11th issue of FLIGHT magazine. "Everyone should receive a general education up to a certain age, and . . . when that age is reached . . . should receive that education which will fit him for the industry or profession he intends to enter. The tricky points to decide are when the first . . . ends, and the second . . . begins, and what kind of education should be given.

"Whether a boy is going in for farming, commercial piloting . . . or politics, his education should be guided by the industries or professions concerned when his general education is finished . . . in exactly the same way as . . . a good builder carries out the schemes of the architect . . . a good teacher for the profession will inculate in his pupils the wants of the industry *as directed by the industry*.

"For argument's sake, I would like to fix the general education limit at sixteen. The first step I should like to see is for the aircraft industry to endow and take control of all aeronautical education after the general education is finished, and of all those who intend to enter the aeronautical profession . . . Take a boy who wishes to become a designer, for example. He would be trained in all workshop processes and methods, concurrently with being taught the fundamental theory of engineering. On the highest rung, he will have gone to the university and would get his B.S. Engineering degree. During the whole of his training, he would have theory and practice side by side . . . During the whole of his training to be an aircraft engineer, the trainee would live in the atmosphere of his future job. The importance of this will be appreciated. (In this connection, Mr. Pritchard encloses a quotation from a speech delivered by Colonel Devereux on January 31, 1943, to the Association of Scientific Workers.)

" 'The young scientist entering industry after several years of the sheltered academic atmosphere of his university, will find many thing which will shock him at first. He will learn, for instance, that most of the processes used are a compromise between that which is technically desirable, and that which is economically possible. And that of the two, the emphasis is probably laid upon the economic point of view. . . . He will have to develop a time-factor sense, an appreciation of the close study of cause and effect in existing practice, and the toleration of the other man's point of view, especially if that is based on experience.' "

Quoting Captain Pritchard himself again:

"If the industry took charge of its own education, Colonel Devereux's cogent point would be met in the training. For every industry and profession to take into its own hands the practical and theoretical training of its own future employes, is, I suppose, a somewhat revolutionary idea. But evolution doesn't come without a certain amount of revolution."

Formula for the Future

Well, I'm not suggesting anything so revolutionary as industry taking over all related education, nor am I proposing that anything be taken away from anybody to give to anybody else.

I heartily agree with the remarks of Mr. E. Sherman Chase, made at the New England section meeting of the SPEE, as reported in the March "Journal of Engineering Education." I quote:

"Any product is judged by how it functions—and this is true of the product of our institutions of learning. Experts always seem to be disagreeing among themselves, particularly educators, but when a rank outsider attempts a suggestion in the educational field, they forget disagreements and gang up on him. However, it should not be forgotten that it is the layman who is the customer for the goods turned out by the universities and technical schools and that he is in a better position to appraise these goods in service than the professor who had only their processing."

May a layman be permitted to summarize certain points of recommendation as follows:

(1) Have the State Universities continue tuition-free, simple courses of the ESMWT or university extension type.

(2) Make these courses good enough for college credit and allow the credit.

(3) Have every instructor in an engineering subject serve periodically in industry on a regular schedule.

(4) Continue year-around schooling, and permit entrance or re-entrance at the beginning of any quarter's work.

(5) Reorganize every engineering curriculum into simple elements, each complete in twelve weeks, and all fitting together to form the pattern required for a B.S. degree.

Industry's Service Men Play Vital Role in War

Service engineers of Boeing Aircraft Company and other aircraft companies have studied the performance of American planes in various combat zones to determine the modification of airplane equipment and spare parts supply dictated by each combat area. Manufacturers have discovered through their service engineers that usefulness of combat planes varies in direct ratio to the ease of maintenance, simplicity of operation and availability of spare parts for repair. Airplane equipment was standardized and simplified where possible to ease the maintenance problem, and extent of parts breakdown and orders for shipment was modified by service engineers to meet tactical requirements.

The manufacturer has learned how to adjust planes to geographical changes from service department crews — "winterizing" techniques came from Alaska service engineers, methods to lessen danger of dust eating out moving parts and grounding planes came from Africa service engineers. Tactical changes in enemy planes are also studied by service engineers, and useful changes adopted in our combat planes if practicable.

U. S. Produced 100,000 War Planes as of May 31

The 100,000th plane produced since the war production program began came off the assembly lines May 31, James F. Byrnes, Director of War Mobilization, declared on the same night.

75,000 Planes is '43 Goal, with Emphasis on Heavy Bombers

Although materials allocation remains confused and will be the determining factor—absenteeism and manpower shortage are not expected to be critical until fall—the aircraft industry in 1943 will be expected to produce 300 per cent more in poundage than in 1942, when 291,000,000 pounds of airplanes were delivered. This year, says President Roosevelt, we will deliver 911,000,000 pounds, with emphasis on heavy bombers. In 1944 the goal is to be 1,417,000,000 pounds.

Numbers of planes were not given. But the 48,000 manufactured last year, of which many were trainers, averaged 6,060 pounds each. Since the 1943 models should weigh twice as much as last year's, according to Donald Nelson's expectations, they would total about 75,000 planes averaging 12,000 pounds apiece.

The value of 1943 aircraft production will total $20,100,000,000, according to the latest Office of War Information estimate. This will be 25 per cent of the total U. S. war budget for the year, one-seventh of our estimated national income (the auto folks at their 1941 peak produced only $3,700,000,000 worth of vehicles—about one-sixth of the aviation industry's output this year). The OWI also says the aircraft industry is currently employing about 2,500,000 workers.

Predictions, originating with Major General Ira Eaker of the 8th Air Force in England some time ago and lately revived by the OWI, are that "new and heavier" bombers—identified by British spokesmen as being the B-29 and the B-32—will be in action shortly.

It has also been revealed that 2,500-h. p. aircraft engines, "25 per cent more powerful than any now in use," have been in production "many months."

Meanwhile, the National Industrial Conference Board said aircraft contracts are being placed at about the same volume as in 1942, $4,900,000,000 worth of planes, parts and equipment being ordered during the first quarter of 1943. This brings to $31,600,000,000 the cumulative total.

Heavy Bomber Goal of 500 Monthly Passed; 1,000 Monthly New Aim

Heavy bombers are being produced in the United States at a rate of over 500 a month and "schedules call for a production of at least 1,000 a month by April, 1944," Charles E. Wilson, executive vice chairman of the WPB recently stated. Wilson added that to meet this goal, output must be greater, as despite rising production rate, output in the first quarter of 1943 was only 20 per cent of the goal for the year, and the 7,000-plane output scheduled for April had not been achieved.

WPB Plans New Aircraft Control System to Increase Heavy Bomber Production

A new aircraft production planning and control system, to operate under the WPB Aircraft Production Board, for increased production of the heavier types of combat aircraft, was adopted at the conclusion of a three-day conference of airplane manufacturers, aluminum fabricators, and Army, Navy and WPB officials with the Aircraft Production Board in Washington recently, Charles E. Wilson, chairman of the APB, announced.

A planning and control group will be established, to include representatives of airframe manufacturers, parts producers, Aircraft Scheduling Unit, and the Aluminum and Magnesium Division of WPB, and among its jobs will be studying inventory positions in the field of fabricated parts where the demand is increasing, in order to "bring out the greatest possible production of certain parts required for the manufacture of the heavier combat ships and their proper distribution to the aircraft manufacturers," Wilson stated.

Fairchild's North Carolina Plant Delivering Trainers

The new Burlington, N. C., plant of Fairchild Engine and Airplane Corp., on May 20 successfully test-flew its first plane, a plywood twin-engine AT-21. The ceremony inaugurating production was attended by Governor J. Melville Broughton of North Carolina, Brig. General Junius Jones, commanding general of the Technical Training Center, Greensboro, N. C.; Colonel Charles W. O'Connor, Army officer at Bell's bomber plant in Georgia; Sherman Fairchild, chairman of the board of Fairchild; and J. Carlton Ward, Jr., Fairchild president. Lee H. Smith is general manager of the new plant.

Brewster Turning Out Corsair Fighters, Parts for PBY and Curtiss-Wright

Brewster Aeronautical Corporation is producing the 2,000-horsepower F4U "Corsair" fighter for the U. S. Navy.

All divisions of Brewster are at work manufacturing parts or assembling the new fighter for the Navy. Major parts and subassemblies are being turned out at Long Island City, N. Y., with some wing tips and tail service fabrication being done at Newark, N. J. Final assembly is at Johnsville, Pa.

A new contract with Consolidated Vultee Aircraft Corporation for the manufacture of wings and floats for Navy PBY-5 Flying Boats, was recently announced by Frederick Riebel, Jr., president of Brewster. Brewster's Newark division has manufactured PBY and Catalina wings and floats for Consolidated since 1940. Recently Brewster arranged with Curtiss-Wright Corporation to manufacture wings and subassemblies for the Army's new C-46 transport planes.

LaMotte Cohu Heads National, Western Councils

LaMotte T. Cohu, chairman of the board of directors of Northrop Aircraft, recently became president of the National Aircraft War Production Council, succeeding Glenn L. Martin, and president of the Aircraft War Production Council (West Coast), succeeding Robert E. Gross of Lockheed. Cohu pioneered in the formation of the American Airlines and American Aircraft and Engine Company (Fairchild), and in 1939 joined in the formation of Northrop Aircraft, Inc., now producing confidential types of airplanes for the U. S. Army.

T. Claude Ryan is vice president of the West Coast group, and Lawrence Bell is vice president of the National Council.

Cost-Improvement Plan Ups Efficiency 250 Per Cent in Building Liberators

Consolidated Vultee Aircraft Corporation recently reported a reduction of man-hours through their cost-improvement plan and other manufacturing methods and controls.

The cost-improvement plan covers suggestions of supervisors, employes and a foreman's cost conversion bonus system. Of 13,000 supervisors' suggestions received from August, 1942, to April, 1943, 5,000 had been accepted resulting in 6,058,000 man-hours saved per year and a 250 per cent efficiency increase in production of the Liberator during the year. Of 9,600 employe suggestions, 1,500 have been accepted and 1,000 are still being investigated. Adopted suggestions have saved 862,906 man-hours per year. The foreman's bonus is paid for individual performance of a department and an average of performance in all productive departments is taken to determine the plant's average. This total is applied equally to all sharing departments and is to encourage inter-departmental co-operation.

In addition to these plans, other man-hours have been saved by arrangement of the plant layout streamlining the system of material handling, improving the tooling program, and simplifying individual assembly jobs.

CAPACITY LOADS of lamb, beef and hog carcasses are flown by the cargo plane of Douglas Aircraft Company to relieve food shortages in various Douglas cafeterias in outlying branch factories.

Significant Savings in Material Reported by North American

How North American Aviation, Inc., is saving critical materials by substitutions was explained by J. H. Kindelberger, president. In citing statistics of the first three months of 1943, Kindelberger pointed out 12,000 pounds of stainless steel sheet stock per month were saved by utilizing mild carbon steel sheet for exhaust stacks on B-25 Mitchell bombers, and 10,000 additional pounds of stainless steel per month were saved by building B-25 firewalls and engine cowlings with mild carbon steel and aluminum alloy.

North American is saving 41,000 pounds of aluminum alloy sheet stock per month by manufacturing one item for the P-51 Mustang fighter from mild carbon steel sheet. Conversions to plastic materials on the B-25 and P-51 are resulting in a saving of 40,000 pounds of aluminum alloy and steel per month, and by adapting rolled sections to the B-25 and P-51 in place of the critical aluminum alloy extruded sections, North American is saving 40,000 pounds of aluminum alloy extrusion stock per month, Kindelberger declared.

Waco Glider Named "Haig" After British Commander

The Army and Navy have named the fifteen-place Waco CG-4A glider the "Haig." The Waco Aircraft Company says the "Haig" was named in honor of Sir Douglas Haig, World War I British commander. The British call their eight-place glider the "Hotspur" and have named their twenty-four-place glider the "Horsa," after famous British fighting men.

Kansas U. Aiding Industry

The Aeronautical Engineering Department of the University of Kansas has trained women aeronautical technicians for work in aircraft plants. Some of them, after completing the sixteen-week course, are employed at the North American Aviation, Inc., modification center in Kansas City.

Ambitious Production Program for Lockheed Constellation

"The Constellation transport has an important place in the company's program," Robert E. Gross, president of Lockheed Aircraft Corporation, Burbank, stated at the annual meeting of stockholders recently. "We have a large program planned for it, and are now tooling and preparing generally for its production. We expect to deliver some Constellations this year and next year will see it really rolling," Gross said.

At a meeting of the board of directors, all officers of the corporation were re-elected. They are R. E. Gross, president; Charles A. Barker, Jr., vice president and treasurer; Cyril Chappellet, Carl B. Squier, and Hall L. Hibbard, vice presidents; R. A. Von Hake, vice president in charge of manufacturing; Louis W. Wulfekuhler, secretary; Dudley E. Browne, comptroller; R. P. King and H. R. Campbell, assistant treasurers.

Boeing at Peak in April

The Boeing Aircraft Company in April set a new production record, P. G. Johnson, Boeing president, announced recently. Not only did April constitute a new record in total number of airplanes built but also in number of pounds of airplanes turned out per man-hour and per square foot of factory space, he said. In the combined categories of pounds per man-hour and pounds per square feet, Boeing production stands highest among all the companies engaged in airplane manufacturing, Johnson said. He emphasized, however, that further acceleration beyond the present level will necessitate additional manpower.

Accomplishments of Douglas Subcontracting Pool Cited

Douglas Aircraft Company, Santa Monica, Calif., is employing methods of subcontracting and pooling production facilities which have increased the Douglas company from two plants in 1940 to eight in 1943, and tripled deliveries of planes in 1942 over those of 1941.

Since July, 1942, Douglas has placed subcontracts to over 300 major and 1,500 lesser automotive and other manufacturers, amounting to over $275,000,000. In pooling production facilities within the industry, Douglas licensed Boeing to build Douglas DB-7 attack bombers; Consolidated has licensed Douglas to assemble Consolidated-designed B-24 Liberators. Boeing, Douglas and Vega have launched a joint plan for concurrent manufacture of Boeing-designed B-17 Flying Fortress. And this pooling practice has been extended by all warplane manufacturers to subcontractors and airframe parts firms. Douglas' plan extends to over 8,000 firms, and Douglas has rendered help to hundreds of subcontractors by loaning them designs, jigs, dies, manufacturing data and techniques, technical experts and training personnel.

Cessna Overhaul Depot Aids Training Schools

An overhaul base where Cessna twin-engined bomber-pilot training planes may be serviced under direct factory supervision has been established at the Hutchinson, Kansas, municipal airport, according to Dwane L. Wallace, president of Cessna Aircraft Company.

NAA Expanding at Kansas City; Production Increasing

The Kansas plant of North American Aviation, Inc., will be expanded rapidly during this year and thousands of new employes will be hired and trained, H. V. Schwalenberg, factory manager, recently announced.

Schwalenberg explained the plant facilities have been expanded and reorganized during recent months to accommodate an over-all new production program. During the past three months a new assembly addition, flight hangar, parking lot, cafeteria and office building have been completed. Additional tooling is being completed for subassemblies and assemblies. New tooling is being fabricated for parts not previously supplied by this plant, Schwalenberg said.

Irving Taylor Leaves Aero Chamber for Douglas

Irving Taylor has resigned as general manager of the Aeronautical Chamber of Commerce of America to become associated on June 1 with the Douglas Aircraft Company in their Santa Monica, Calif., office, where he will handle special assignments, A. M. Rochlen, director of the industrial and public relations of Douglas, recently announced. Taylor has been with the Aeronautical Chamber of Commerce since 1939, and prior to that was a grade commissioner and commercial attache in the United States and abroad for the U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce.

Consolidated's Experimental Leader Now at Ft. Worth

R. C. Maving, formerly in charge of the Consolidated Vultee's Experimental Factory at San Diego, has been named general superintendent of Consoldated Vultee's experimental work at Fort Worth. L. J. Bauer will continue as superintendent of the Fort Worth Experimental Department, working under Maving.

Vandeburg Manager of East Coast Council

Clyde M. Vandeburg, former assistant to the president of the Packard Motor Company and until recently connected with the Office of War Information, has been appointed general manager of the Aircraft War Production Council, East Coast, Inc. John Rodick has been serving as acting general manager.

Hazeltine Electronics Expands

With the completion of greatly expanded facilities, the Hazeltine Service Corporation of New York has changed its name to Hazeltine Electronics Corporation. The organization, performing many services of a secret nature for the maintenance of the U. S. technical superiority over the Axis, is equipped to undertake the solution of the most complex problems in electronics, especially in aviation. Manufacturers will find Hazeltine a source of the most advanced efectronic developments.

Parts Makers Produce Job Dictionary for Workers

Aircraft Parts Manufacturers Association, Los Angeles, recently published a "Job Dictionary for the Aircraft Manufacturing Industry," defining the work of their employes.

The information was gathered by committees of the Association from a representative group of parts plants in the Los Angeles area. Dr. Vernon D. Keeler supervised the compilation.

AIRLINES

Global Routes Must Wait

The recent flurry of applications for new international and domestic air routes does not mean action by the Civil Aeronautics Board will be taken immediately or that early birds will be favored. So announced the CAB on May 7, restating its policy, adopted December 12, 1941, of postponing indefinitely any action on bids for postwar operations not now feasible.

Airlines Continue to Set New Traffic Records

The United States domestic airlines set new records for volume of cargo, air mail and revenue passenger-miles in 1942, E. S. Gorrell, president of Air Transport Association of America, announced recently. Air cargo increased more than 108 per cent, while air mail volume was up 55 per cent and revenue passenger-miles were "about two per cent greater than in 1941, the best previous year," Mr. Gorrell stated.

Trippe Urges U. S. Offer Transports to Other Nations

Juan T. Trippe, founder and president of the Pan American airways system, urged recently that the United States make available to Great Britain and to other allied nations all the transoceanic air transports they need for postwar air competition among the nations.

"I believe that America's international air transport system should be second to no nation's on earth," he said. "The United States is rightfully entitled to that leadership by our history of pioneering and by our record of performance. But I am also convinced that America can maintain that position on its merit, without taking undue advantage. We all share the healthy American aspiration to win a ball game or a business competition. But fair is fair. We want to win the ball game by out-hitting the other fellow, not by taking his bat away."

Rep. Nichols to Quit Congress for TWA Post

Rep. Jack Nichols, member of Congress from Oklahoma for five terms and chairman of the House committee which studied civil and commercial aviation, will resign to accept a position as vice president of Transcontinental & Western Air, Inc., in Kansas City. Jack Frye, president, announced Nichols will assume his new duties "in the near future, following his resignation from Congress."

PCA Tops 'em All with Atlantic Seadrome "Plan"

With Great Circle polar routes attracting wide publicity, and helicopter shuttle service winning still more space, proposals for postwar air transport reached the peak of the dramatic scale last month when Pennsylvania-Central Airlines put in for a transatlantic route using seadromes—"floating islands of steel"—for intermediate bases. Elaborating on the "dramatic, revolutionary but practical" plan, President C. Bedell Monro said there would be a seadrome every 800 miles, each a 64,000-ton structure standing seventy feet above the water and having a 160-foot draft to prevent pitching and rolling. He reminded skeptics that it is essential to carry payload, not an abundance of fuel, to make air transport economical and to lower passenger fares. "The seadrome route is the first practical method to make this possible" he said.

Delta Gets Shreveport-New Orleans Operation

The Civil Aeronautics Board last month amended the certificate of Delta Air Corporation extending its southern transcontinental route between Fort Worth and Charleston from Shreveport to New Orleans, via Alexandria and Baton Rouge. The new service will not prevent establishment of a route from Tulsa or Kansas City to New Orleans via Shreveport, the Board said, referring to applications by Mid-Continent Air Lines and Kansas City Southern Air Transport. Eastern Air Lines was granted permission to serve Lake Charles, La., as an intermediate point between Baton Rouge and Beaumont on their route originating in New York.

Caribbean Routes Awarded Five Foreign Lines by CAB

Carrying the "approval" of President Roosevelt, temporary six-month permits have been granted by the Civil Aeronautics Board to five foreign air carriers for transportation between Miami, Fla., the Caribbean area and Central America. Applications by Eastern Air Lines, Inc., and National Airlines, Inc., for Caribbean runs were denied. The permits were granted to TACA, S. A., British West Indian Airways, Royal Dutch (KLM) Airlines, Expreso Aero Inter-Americano S. A., and Compania Nacional Cubana de Aviacion, S. A.

Business Good, Too

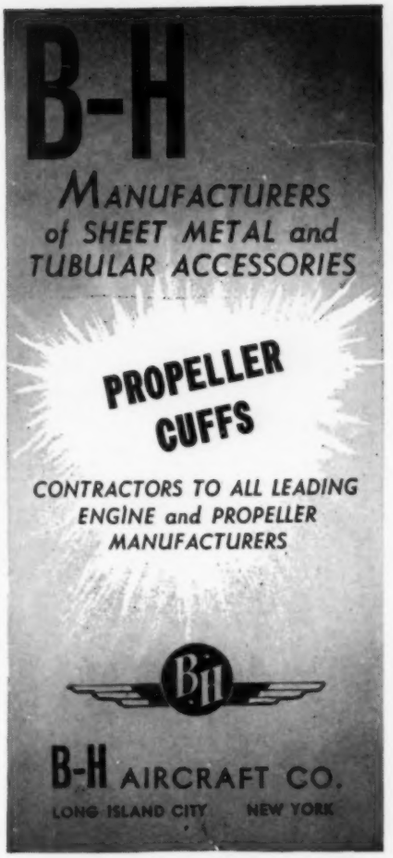
Gilpin Airlines is flying a regular route between Tucson and Phoenix, Arizona, every Monday, Wednesday and Friday, leaving Tucson at 9 a. m. and returning at 4:30 p. m. Walter Douglas, Jr., is president and chief pilot.

Committee Studying Shortage of Aircraft Fittings, Valves

An Industry Committee for Aircraft Valves and Fittings has been formed in Dayton, Ohio, under the Aircraft Scheduling Unit, at the direction of Lt. Colonel J. V. O. Weaver, Government presiding officer, with Captains B. N. Agather, A. F. Kreusch and R. F. Cohen assisting.

The committee represents all types of valve and fitting manufacturers and includes: F. E. Amon, Parker Appliance Co., Cleveland; E. H. Barrow, Commonwealth Brass Co., Detroit; A. J. Dolan, Dolan Manufacturing Co., Dallas; R. W. Ellis, Dole Aircraft Manufacturing Company, Chicago; L. J. Henderson, Weatherhead Company, Cleveland; I. W. Masters, Irving Masters Company, Los Angeles, and A. G. Zibell of Kohler Co., Kohler, Wisconsin.

This committee was formed for the purpose of co-ordinating manufacturers of valves and fittings and for the proper utilization of available facilities to alleviate the critical shortage of aircraft fittings, according to Dolan.

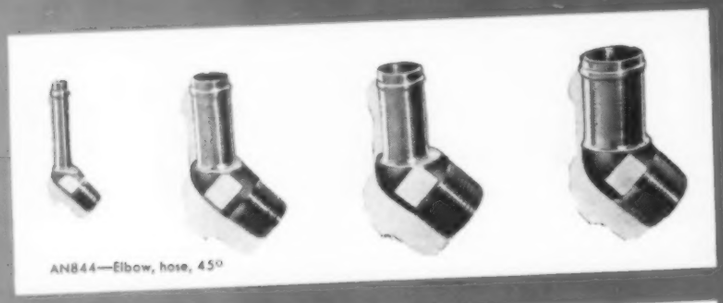


WITTEK
AVIATION HOSE CLAMPS
Standard Equipment on
REPUBLIC P-47 THUNDERBOLT

Since the beginning of modern aviation Wittek Hose Clamps have been known as the standard of the industry. Today they are being used by the nation's leading military aircraft and engine builders.

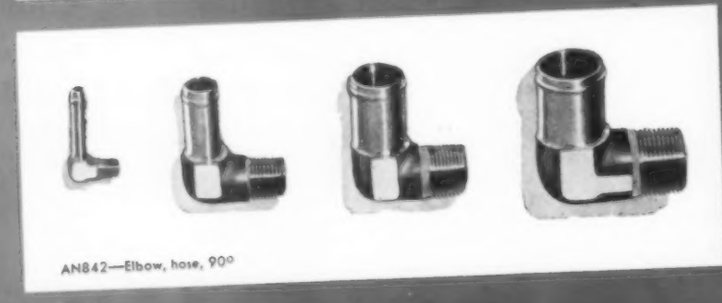
ARMY NAVY
WITTEK Aviation HOSE CLAMPS

DURAL, MANGANESE BRONZE HOSE FITTINGS



AN844—Elbow, hose, 45°

AN840—Nipple, hose, straight



AN842—Elbow, hose, 90°

Special tooling and 24-hour-a-day production is enabling us to meet the aircraft industry's ever increasing demands for *Dural* and Manganese Bronze hose fittings.

We are now manufacturing the AN-840 to 849 series. All parts, except bar stock fittings, are pressure tested by air, under kerosene, to 100 lbs. gauge pressure. Blueprint tolerances are maintained.

Our production control follows each order from the time it is received until delivery is made to your plant.

Write or wire our Los Angeles office. or the branch office nearest you.

HARTWELL AVIATION SUPPLY COMPANY

Aircraft Production Parts

3417 CRENSHAW BLVD., LOS ANGELES • DALLAS, TEXAS • DETROIT, MICH • KANSAS CITY, KAN.

A WRIGHT CYCLONE ENGINE exhaust valve which operated 110 hours after an enemy bullet had drilled a hole in the valve stem is examined by Myron B. Gordon, vice president and general manager of Wright Aeronautical Corporation. The engine was installed in a Curtiss (75-A) Mohawk fighter operated by a British flying unit "somewhere in the Orient".

Reynolds Lists "Firsts"

On the second anniversary of the inauguration of operations at the Listerhill, Alabama, plant of the Reynolds Metals Company, Richard Samuel Reynolds, president of the company, said that the plant had accomplished the following "firsts":

It is the first complete aluminum plant in the world, carrying the entire process from bauxite to finshed metal. It has the biggest open hearth oil-fired remelt furnace used exclusively for aluminum, in the world. It has one of the biggest hot roll mills in the world. It was not only completed but in full operation in five months and twenty-eight days from the time turf was broken. It stretches over one square mile, with forty-two acres of plant under roof.

At the Reynolds Aircraft Parts Division in Louisville, sheet aluminum, milled at Listerhill and Louisville, is fabricated directly into aircraft parts. This not only saves tools, manpower and transportation, but also immediately restores to production about 2,000,000 pounds of aluminum each month, which would otherwise go into scrap at the aircraft factory.

Ohio State University Pushing Aero Training

After acquiring recently a flying field and new hangars and equipment, Ohio State University at Columbus has taken steps to develop a school of aeronautics and additional courses in both engineering and commercial aspects of aviation. Close relationships have already been established with Army authorities at Wright and Patterson fields, both of which are about eighty miles from the campus. A program in commercial aviation will introduce special courses in air transport economics, traffic management, sales management and air law. Each student in this field will be employed for at least three months by an aviation company prior to graduation, according to plans.

New SAE Handbook Issued

The 1943 SAE Handbook, containing war emergency standards and recommendations, and representing the thirty-third revision of the "SAE Data Book," published in 1911, has been issued, the Society of Automotive Engineers recently announced. The thirty-third edition features new, revised and emergency materials specifications designed to conserve critical materials, expedite procurement, and otherwise meet war emergency needs.

The Aeronautical Section contains additions to and revisions of SAE Aeronautical Materials Specifications, Aeronautical Standards, Aeronautical Recommended Practices and Aeronautical Information Reports.

Copies have been sent to the military services of the United Nations, government agencies and to SAE members.

NEW LITERATURE

The Weatherhead Company, *300 East 131st Street, Cleveland, Ohio,* is releasing to the aviation industry a new publication—the AN-AC-NAF Conversion Charts manual. These charts are the answer to widespread demands from engineers, technicians, and other aviation men who work with aircraft parts.

Specifications numbers, and other data for each part are given along with corresponding data for Weatherhead and Parker Part fittings, making possible quick comparisons between them. This facilitates rapid determination of manufacturers' numbers which are used to identify similar parts.

Shiftograph Designed to Simplify Work Schedules

Designed by the George S. May Company, New York and Chicago, firm of business engineers, the "Shiftograph" is an instrument for use as a perpetual work shift schedule. By simply turning a dial, the user can tell at a glance what shifts certain crews will work, the days they work, and their days off.

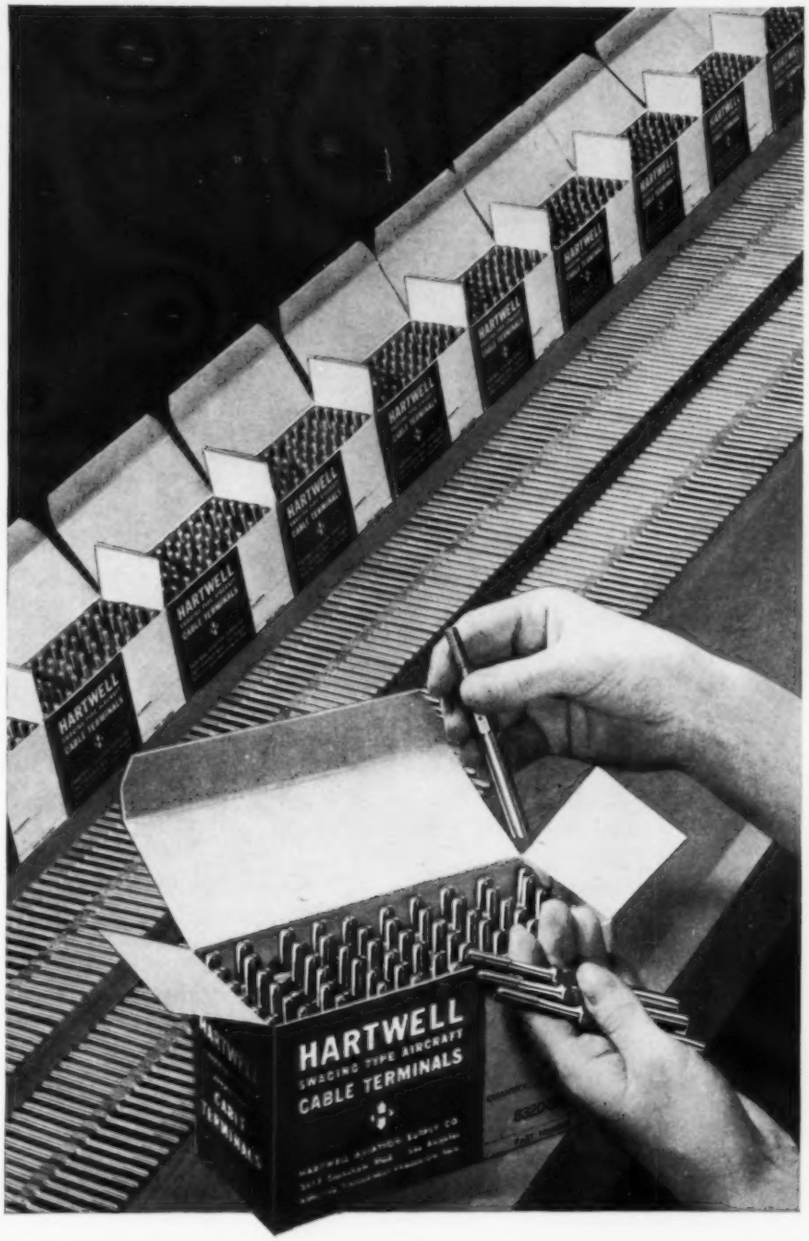
More than 150,000 of these instruments are being distributed free of charge by the George S. May Company as its contribution to America's war effort.

United States Rubber Company, *Synthetic Rubber Division, 1230 Sixth Ave., New York City,* has published a booklet titled "The Five Commercial Types of Synthetic Rubber". Compiled for sales engineers of the rubber company, the booklet has been called the first technically accurate statement of the overall synthetic rubber situation which can be understood by the layman. It is available free upon application.

The Cooper-Bessemer Corporation, *Mount Vernon, Ohio,* has released a new 12-page bulletin which gives a comprehensive description of this firm's broad line of "Victory" tool shanks.

The booklet is free on request. Specify bulletin 53T-2 and address your request to Dept. P.

Plomb Tool Company, *2209 Santa Fe Ave., Los Angeles, California,* has issued a 34-page illustrated booklet titled: "These Are Your Weapons". This book is dedicated to the workers on the American production front, with the hope that it will excite the members of our industrial army to do their own particular tasks in the *one best way.* Single copies will be sent free on request. In quantity, they will be supplied free to accredited schools and colleges, and at cost to essential war industries.



Protected from Our Inspection Line to YOUR Production Line!

Injury to the surface can cause high-tension-load cable terminals to fail. That's the reason Hartwell Swaged Cable Terminals come to you packed in die-cut cartons.

Convenient and easy to handle, the cartons not only protect the mirror-like finish of cable terminals from our inspection line to *your production line,* but reduce dispatching time in your plant.

All Hartwell Swaged Cable Terminals are manufactured to tolerances that meet or are better than specifications. Complete inspection after each production operation insures their high quality.

Machines designed exclusively for the production of cable terminals are turning out threaded and eye type terminals in increasing quantities. Write or wire our Los Angeles office, or the branch office nearest you.

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Aircraft Production Parts

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LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS

ARE TO WIN!

★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

This year we've got to top *all* these figures—and top them handsomely! For the swiftly accelerated purchase of War Bonds is one of the greatest services we can render to our country . . . and to our own sons . . . and our neighbors' sons. Through the mounting purchase of War Bonds we forge a more potent weapon of victory, and build stronger bulwarks for the preservation of the American way of life.

"But there's a Pay-Roll Savings Plan already running in my plant."

Sure, there is—but how long is it since *you've* done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your nation, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

You've done your bit Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY

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WILLIS SCHLOSSER AGERTER GALBREATH HANLEY POHL

Personals

HUGH WILLIS has been appointed general sales manager of the Sperry Gyroscope Company, Inc. He was formerly chief research director, has been with Sperry since 1931 . . . DAVID A. SCHLOSSER, previously chief materials engineer for Lockheed Aircraft Corporation, has been appointed assistant to the president of Adel Precision Products Corp. . . . HARRY AGERTER, newly appointed general manager of Aircraft Components, Inc., will manage the company's Van Nuys, Calif., and Wichita, Kansas, plants. Agerter at one time was an aeronautical consultant, Aircraft Priority Branch, War Production Board. . . . J. CHARLES GALBREATH was recently elected vice president of Plomb Tool Company. Galbreath will retain his former position as general supervisor of Plomb's contract department. . . . THOMAS F. HANLEY was recently appointed general manager of the Dowty Equipment Corporation, Long Island City and Sunnyside, L. I. Hanley is treasurer and a director of Dowty.

WALTER F. POHL of Atlanta, Ga., has been appointed district engineer for the Southeastern area of E. F. Drew & Co., Inc., American Colloid Division.

PALMER NICHOLLS was recently elected president of Bendix Aviation, Ltd., North Hollywood Calif. He will continue as general manager of this Bendix subsidiary. . . . RICHARD S. MITCHELL, formerly operations manager for Consairway, has been appointed manager of the Consairway Division of Consolidated Vultee Aircraft Corporation. . . . CHARLES H. GALE has joined the Cleveland office of Hill and Knowlton, public relations organization. Gale was formerly with the public relations department of the Fairchild Engine and Airplane Corporation. . . . W. M. KIMBALL, former Minneapolis newspaperman, has replaced Gale at Fairchild as editor of the Pegasus. . . . RALPH O. PROCTOR has resigned his post as San Diego office manager for the WPB to accept an appointment as chief field engineer and assistant to the general manager of the Malabar Machine Company, Los Angeles. . . . BERT CONWAY has been named manufacturing co-ordinator for the Aviation Corporation, Detroit. Conway was formerly with General Motors Corporation in charge of manufacturing and production testing at the Allison aircraft engine plant in Indianapolis. . . . GENE H. WHITE, formerly liaison engineer with the Burbank office of Adel Precision Products Corp., was recently selected as assistant Eastern engineering representative for Adel out of the Hagerstown, Maryland office.

Carl Cover Going on Active Duty with Army

Major Carl A. Cover, who has filled many Air Corps posts since World War I, but who retired from active duty in 1929, is leaving his position as executive vice president of the Douglas Aircraft Company to re-enter the Army Air Forces at the request of General Henry H. Arnold and other top-ranking AAF officers. His assignment was not disclosed, but factors in his selection were his wide experience and acquaintance with materiel and procurement, his ability as a test pilot and his wide contacts in the industry. Since 1930, when he joined Douglas, Cover has been the first to fly every new Douglas model except one.

Lee Addresses SAE

John G. Lee, assistant director of research of United Aircraft Corporation, speaking on the "Engineering Background of the Fighter Airplane," addressed the May meeting of the Cleveland section of SAE at a dinner given by the Weatherhead Company in Cleveland.

Lee discussed various types of engines and explained the air-cooled versus liquid-cooled engines controversy. According to Mr. Lee, liquid-cooled engines are inferior in that when hit by enemy shell fire, the cooling liquid is lost and the operation of the engine impaired.

Consolidated Changes

Consolidated Vultee Aircraft Corporation recently announced the following personnel changes: Frank A. Learman, general sales manager; R. B. Parkhurst, chief industrial engineer on the staff of C. W. Perelle, vice president; W. W. Lampkin, assistant chief industrial engineer; C. R. Dockstader, San Diego division chief industrial engineer.

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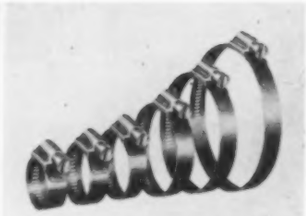
NEW PRODUCTS

Equalizing Flow Divider by Pesco

Pump Engineering Service Corporation of Cleveland, Ohio, has developed a hydraulic equalizing flow divider with pressure balancing and thermal relief valves, for use in aircraft hydraulic systems to divide hydraulic flow from a single inlet into two outlets, with the flow maintained equal in volume regardless of the pressure differential.

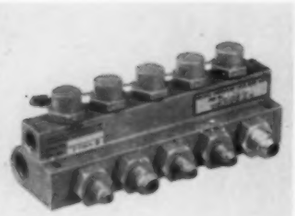
Most New Workers Women

Seventy to eighty per cent of workers now being hired by aircraft companies are women. Approximately 30 per cent of aircraft workers now employed are women, and this figure is expected to rise to 50 per cent by the end of the year.



New Hose Clamps in 14 Sizes

Aircraft Standard Parts Company of Rockford, Illinois, has introduced a new line of "Aero-Seal" hose clamps in fourteen sizes, ranging from three-fourths inch to four inches inside hose diameter. The "Aero-Seal" hose clamp consists of a nine-sixteenth inch tempered steel band punched with holes corresponding to teeth of a worm gear. These holes mesh with a worm in the housing welded to the fixed end of the band. The worm is turned by a screwdriver, and the screw head on the worm is fitted with a safety cup to prevent the screwdriver from slipping and puncturing the hose, and makes the screw slot easy to find in dark, cramped or concealed places. A ten-pitch thread when turned has a belt-like tightness that produces a uniform tangential pull.



Piccolo Valve for Hydraulic System

A new combination multiple check-relief valve assembly, known as the "Piccolo" valve, because of its shape, with valve units discharging into a common return line, has been developed by Kenyon Instrument Company, Inc., of New York for use in high-pressure hydraulic systems of aircraft. The new Kenyon assembly centralizes the thermal expansion relief valves of several closed hydraulic systems and simplifies service maintenance by locating the assembly in an accessible spot on the aircraft.

Paper Plastic Given Name

"Structomold" is the name given to the McDonnell Aircraft Corporation's laminated paper plastic, adaptable to aircraft and general industrial uses.

Portable Hydraulic Test Stand

A new "Hydroilic" portable test stand, driven by an electric motor, to test hydraulic systems and component parts of airplanes has been announced by Denison Engineering Company of Columbus, Ohio. The test stand Model HTS3EM, checks entire hydraulic systems including valves and lines of aircraft operating on pressures up to 3,000 pounds per square inch. The stand is driven by a seven and one-half hp., 1,200 rmp, three-phase, 220-volt, constant speed motor. Fluid is supplied from the airplane or tester reservoir. The suction and pressure lines of the airplane's hydraulic system are disconnected from the system's pump and connected to the test stand.

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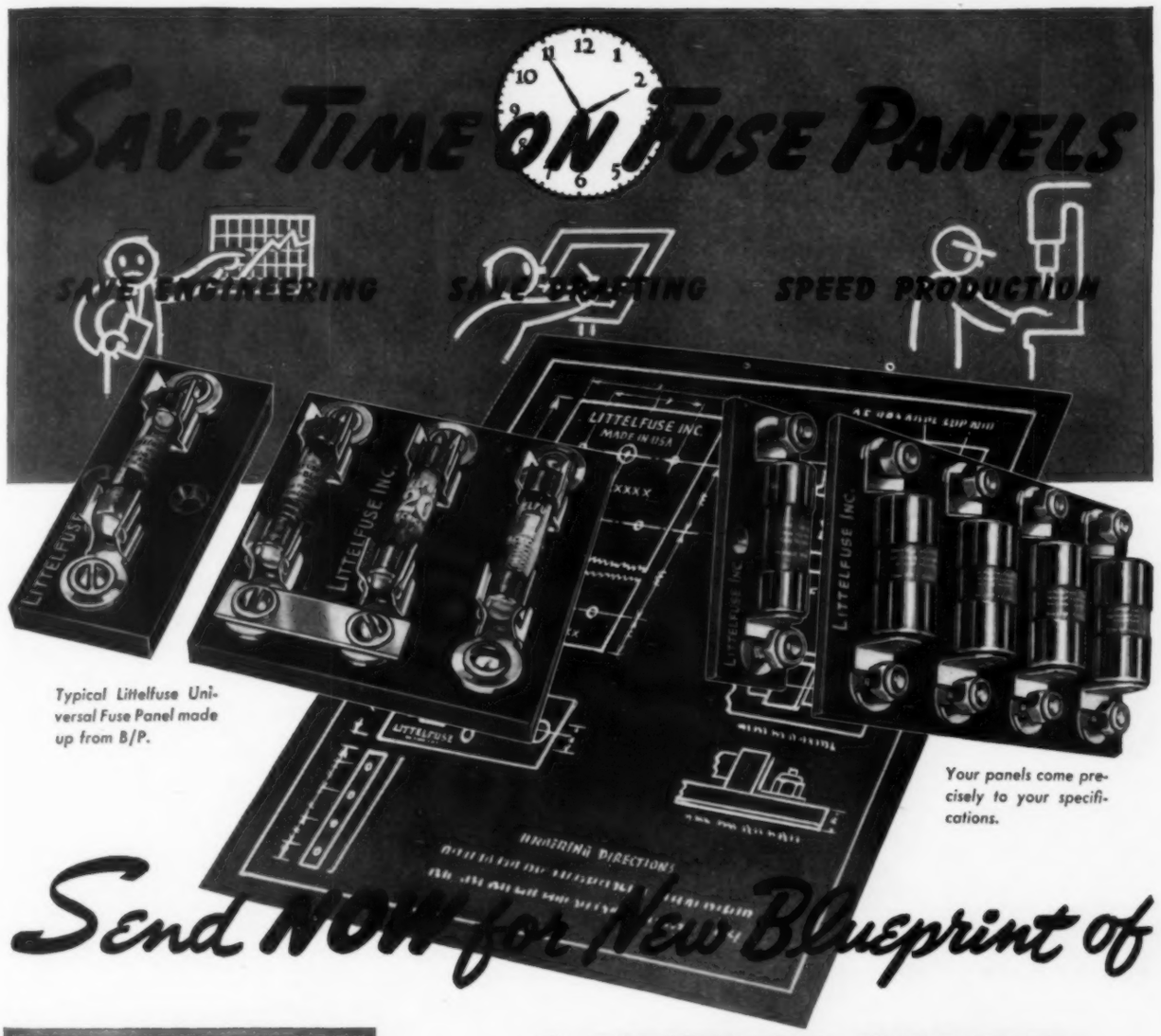

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Contracts with Civilian Tech Schools Cancelled by War Department

Explaining that they are no longer needed by the Air Forces the War Department last month announced cancellation of contracts with civilian technical schools which have supplemented AAF technical training efforts. The AAF program, it was said, has reached its peak and must level off.

Japan Raids Promised as Chennault Visits U. S.

A visit to Washington last month by Major General Claire Chennault, commanding the 14th U. S. Air Force in China, coincided with promises by President Roosevelt, Prime Minister Churchill, who also was in the capital, and General H. H. Arnold that Japan's homeland will be bombed vigorously. Gen. Chennault's views and news of China activities were closely guarded during his visit, little being released for publication.

Higgins Gets Dr. Hanbrook

The educational training programs of Higgins Aircraft, Inc., of New Orleans, is being directed by Dr. Robert W. Hanbrook, veteran aviation educator, who recently resigned as director of aero education for the U. S. Office of Education.

Operators Meet in Dallas

A regional meeting of the Aviation War Activities, was held in Dallas on May 13-14. Gene Royer, temporary president, and R. R. Milsap, secretary and treasurer, presided. It was decided to investigate further the possibilities of flight training for high school students, and to increase the membership in the fourth region to include all types of operators, and other people connected with aviation.

Texas Fight Finally Won

A bill to regulate aviation by the state railroad commission was killed in the Texas legislature during its closing sessions last month. Defeat came in the form of a successful tabling motion, preventing its further consideration. Meanwhile the National Aviation Training Association says a Florida bill, full of regulatory and fee proposals, is pocketed in committee, and a Washington state bill aimed at air control has been killed.

Rosendahl Now Admiral, Back from Sea Duty

Returning to Washington after months of sea duty, Captain Charles E. Rosendahl has been made a rear admiral and is in charge of important lighter-than-air efforts of the Navy. The Texas champion of blimps and dirigibles has vigorously worked for recognition of lighter-than-air aviation and believes giant dirigibles much larger than any ever built, will ultimately be favored for air cargo over great distances.

Seven Airport Projects Reinstated by War Board

The War Production Board has reinstated seven Civil Aeronautics Administration airport projects which had been halted January 15. The original appropriations for the airports totaled $4,603,325. Not all of the airports will be completed, but work will progress to make them suitable for emergency landing and servicing fields. The airports are located at Willcox, Ariz.; Cushing, Okla.; Bradford-Kane, Penn.; Nogales, Ariz.; Natchez, Miss.; Mason City, Iowa; and Artesia, N. M.

Brazil Plans "Wright Field" to Promote Aeronautics

The Brazilian government plans to establish an aviation development center patterned after Wright Field in Dayton, Ohio, it was recently disclosed by Colonel Casimir Montenegro, Brazilian flying officer and pioneer military airline pilot, on his tour of the materiel center at Wright Field as the guest of U. S. Army officials.

Stating that large-scale air transport development in Brazil is planned during and after the war, Colonel Montenegro said that their "Wright Field" would be on a smaller scale, but would include features for the development of both army and naval aviation and work on light planes and commercial airline methods.

Blimp Patrols Extended

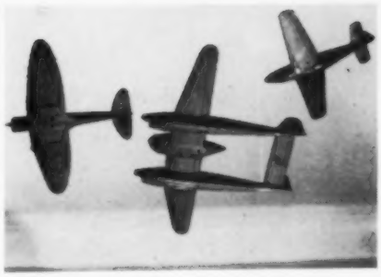
Non-rigid Navy airships are conducting extensive submarine patrols in widely-spread bases outside the continental United States, it was recently announced in Washington.

One of the 200 airships authorized nine months ago by Congress recently completed a 3,000-mile flight in four days, making intermediate stops along the route. The new patrol area is 2,500 miles from the nearest airship dock, yet this trip was completed without incident, and the squadron commander commended for the "efficient consummation of the mission."

Richard du Pont Heads Army Glider Project as Arnold's Special Aide

Richard C. du Pont, one of America's outstanding authorities on glider and air pick-up operations, has resigned as president and board chairman of All American Aviation, Inc., to become special civilian assistant to the commanding general of the Army Air Forces. He has charge of the Army's glider program. A lieutenant in the Air Corps during World War I, du Pont presently is a major in the Air Corps Reserve. At one time he held the world's altitude and distance records for soaring.

H. R. Bazley of Pittsburgh, Pa., vice president, has succeeded du Pont as president of All American.



JAPANESE, GERMAN and Italian airplane models, molded of Lumarith plastic, are to be used for identification instruction by the armed forces. They are manufactured by Cruver Manufacturing Company, Chicago, Ill.

Al Williams Says Army's High Schoolers Good as College Grads as Pilots

Is a college education, or two years of it, or the equivalent, a necessary qualification for a pilot?

"Nonsense," says Major Al Williams, father of dive bombing and one of America's most capable aviation writers. On leave from the Gulf Oil Corporation, of which he is aviation manager, Maj. Williams has been lecturing and demonstrating to thousands of Army Air Force cadets and pilots at bases in the South—a tour set up for him by the War Department. In his regular Scripps-Howard newspaper column recently, in which he commented on the young crop of pilots, Williams said the prewar theory that a college education or its equivalent was a necessary qualification for a pilot has been scuttled by the performance of young America in the Air Corps training centers, adding:

"That theory was nonsense and now is proven nonsense by statistics which show that the college graduate outranks the mere high school graduate by less than four-tenths of one per cent in all-around adaptability and fitness for aerial combat."

Birmingham Aero Club Cites Leaders, Nominates Officers

The Birmingham Aero Club Trophy for the outstanding contribution in the promotion of aviation in the city of Birmingham for 1942 was recently awarded to Colonel W. J. Wise, and citations for their untiring efforts in bringing to Birmingham the Bechtel-McCone-Parsons Corporation's new modification plant" were given to George Mattison and Hayden Brooks, of Birmingham.

Nominations for officers and governors of the Aero Club are as follows: T. G. Arnold, president; Dan R. Hudson, first vice president; Alex C. Montgomery, second vice president; Don D. Campbell, third vice president; Brown G. Hill, secretary; Geo. G. Cowden, treasurer; Edith Wideman, recording secretary; and Steadham Acker, Frank G. Brewer, Hayden Brooks, Holland E. Cox, Henry J. Martin, Jas. E. Mills, Clarence McDorman, Alex Patterson, Margaret Simpson, Robert L. Sims, Ragnar Thele, and W. J. Wise, governors.

09- Designation

0. A unit will be designated by order of the National Commander, initiated by him or in response to a request from a Wing Commander, and will be redesignated on change in its status.

1. Wing units will be designated on proof that they are composed of the prescribed number of members and component units. Pending designation, unit commanders may form provisional units under their command.

2. In case of shrinkage in active membership below the prescribed minimum, the organization of a Wing will be revised to conform with the provisions of (03-2); a Group will be disestablished and its component units assigned directly to the Wing or to another Group; a Squadron will be reorganized as a Flight; a Flight will be disestablished and its members assigned to other units. Similarly, a unit which expands beyond the prescribed maximum will be divided into two units or raised to higher unit status. Such revisions will be reported to the National Commander for redesignation of the units.

3. Wing units will be named as follows:

1 Wings, by the name of the State or other area they cover. Example: New York Wing.

2 Groups, as the 1st, 2nd, etc. in the Wing. Example: 4th Group, Ind.

3 Squadrons by the name of the city or county. Where there are more than two Squadrons in a city or when a place name is not desired, they will be numbered. (Baltimore Squadron, Md.; Arlington County Squadron, Va.; Cleveland Squadron 2, Ohio; Squadron 12, Pa.)

4 Detached Flights, by the name of city or county or by special unit designation. (Tucson Flight, Ariz.; Band Flight, Ala.)

5 Wing Headquarters Flights, by the letter H. (H Flight, Calif.)

6. Flights, by the letters A to F and the name or number of the Squadron. (B Flight, Little Rock, Ark.; C Flight, Pittsburgh 3, Pa.)

7 Sections, by numbers 1 to 4 or by functions as in (07-3). (Section 2, D Flight; Medical Section.)

4. Operations units will be designated under prescribed procedure (4) by the following names:

1 Units of a patrol nature, as Patrols. Example: Wisconsin Forest Patrol; CAP Coastal Patrol No. 2.

2 Other units operating from fixed bases, as Stations. (York Courier Station, Pa.)

3 Operations conducted by a number of units, from a number of bases, or from no fixed base will be designated as Services. (2nd Air Force Courier Service.)

5. Standard abbreviations (8) will be used in referring to units in CAP communications.

62-a

02- National Headquarters

0. The National Officers of CAP will be Officers of the Army of the United States assigned to duty at CAP National Headquarters.

1 National Officers, headed by the National Commander and under his orders, will be the Executive Officer, Operations Officer, Intelligence Officer, Training Officer, Co-ordinating Officer, Finance Officer, Supply Officer, and such others as the National Commander may appoint. An order issued by a National Officer by order of the National Commander will have the same effect as if by the National Commander.

2 The National Staff will consist of the National Officers and civilian employes assigned to National Headquarters.

03- Wings

0. A Wing will be composed of CAP members assigned to it within a State or other area fixed by the National Commander. Wings and their component units will function as:

1 Volunteer units to mobilize and train civilians with skills and equipment applicable to aviation and auxiliary duties, and to conduct emergency operations.

2 Recruitment, training, and replacement centers to provide personnel and equipment for operations of CAP and other Federal services.

1. The Wing officers will be the Wing Commander and Wing Staff.

1 One or more civilian employes may be assigned to assist the Wing Commander. They will enlist in CAP and may be appointed as Wing officers.

2. Component units will be as follows:

1 A Wing with less than 150 members will be organized into Flights.

2 A Wing with over 150 members may be organized into Squadrons and Flights. If less than four Squadrons, the Wing will maintain joint headquarters with one of its Squadrons and the Wing Staff will serve concurrently as officers of Squadrons in the Wing.

3 A Wing with more than ten Squadrons may be organized into Groups, Squadrons, and Flights.

3. For purposes of co-operation, a Wing Commander my communicate directly with other Wing Commanders and with operations units in his Wing area; a unit commander with commanders of adjacent units and units directly under his immediate commander.

1 A Wing or unit thereof may co-operate in its area with elements of the Army, Navy, Marines, and Coast Guard; State guards; State and local defense councils; agencies of Federal, State, and local governments; United Service Organizations; war industries; the American Red Cross; and schools and colleges operating training programs under Federal contract. It may co-operate with other organizations with special approval of the National Commander or in performance of emergency missions.

2 With the exception of instructors (30-5), only CAP personnel will participate in CAP activities other than social events, except in emergency.

04- Groups

0. A Group will be composed of not less than 200 members organized in not less than three Squadrons and may include Detached Flights.

1. The Group officers will be the Group Commander and Group Staff. The Group will maintain joint headquarters with one of its Squadrons. The Group Staff will serve concurrently as officers of component Squadrons.

05- Squadrons

0. A Squadron will be composed of not less than fifty members, residing close enough to the Squadron Headquarters to attend meetings there, and not more than 200 members.

1. The Squadron officers will be the Squadron Commander and Squadron Staff.

2. The Squadron will be divided into not less than two or more than six Flights whose headquarters will be that of the Squadron. The number of Flights multiplied by twenty-five will not exceed the number of members in the Squadron.

06- Flights and Sections

0. A Flight will be composed of not less than ten or more than sixty members. A Detached Flight is one which is not a part of a Squadron but reports directly to a Group or Wing Command.

1. Flights will be commanded as follows:

1 If not more than fifteen members, a Flight Leader and Flight Sergeant.

2 From fifteen to twenty-five members, a Flight Leader, Assistant Flight Leader, and Flight Sergeant. The Flight will be divided into two Sections, each commanded by one of the latter two officers.

3 With more than twenty-five members, the Flight Leader, Assistant Flight Leader, and Flight Sergeant will constitute the Flight Staff and a Section Leader will be appointed for each Section. Not more than four Sections will be formed in a Flight. The number of Sections multiplied by ten will not exceed the number of members in the Flight.

2. A Section will be composed of not less than five or more than thirty members and will be organized under a Flight. Sections may be established or disestablished and their leaders appointed or removed (01-6.2) without notifying the National Commander, provided their composition conforms with CAP Rules. A Section will have a Section Leader and an Assistant Leader; if more than fifteen members, two Assistant Leaders. A special Section, (07) in the performance of its special duties, may report to a Squadron Staff Officer or act under its Section Leader.

07- Special Units

0. Special units to serve as permanent Wing components for special duties usually will be designated as Sections.

1. Special units reporting directly to a Wing Command may include:

1 One Heaquarters Flight, which may include a Band Section.

2 Units for functions authorized in (07-3) may be organized as Squadrons of Flights reporting directly to a Wing only by order of the National Commander on proof that special circumstances require this irregular form of organization.

2. A Group will have no special units except those of the Squadron with which it maintains headquarters. Special units of component Squadrons or Flights may be mobilized for training or operations under a Group Staff Officer. Example: Medical Sections within a Group may report to the Group Medical Officer.

3. Special units in a Squadron or Detached Flight are authorized as Sections under designations which follow:

1 Headquarters	8 Ranger (including Motorized, Mounted, Foot, or Ski Sections usually employed in rescue missions)
2 Communications	9 Parachute
3 Photo	10 Transport
4 Medical	11 Airport
5 Band	12 Maintenance
6 Guard	13 Weather
7 Crash	14 Map

08- Operations Units

0. Operations units, composed of CAP members only, will be established for the performance of authorized operations over a period of time, while most operations of brief duration will be performed by Wing units or temporary detachments thereof.

1. National field units are the Patrols of the CAP Coastal Patrol and of the Southern Liaison Patrol, under the direct command of the National Commander. Their commander may communicate with each other and with the commander of Wings and adjacent Wing units for purposes of cooperation.

2. A Wing operations unit may be established to operate under a Wing Commander. He will serve as Operations Officer of all operations performed by such units which may operate beyond the geographical boundaries of his Wing and may be authorized for military and industrial courier services, forest patrol, and other missions authorized by the National Commander. A regular unit of a Wing may be designated as an operations unit for the performance of specific operations.

62-b

Civil Air Patrol

Requirements for Renting Planes for Instruction

Many CAP members and prospective members can obtain permission under CAA and WPB rules, to buy flight time and gain the required number of hours and qualify for active duty. To aid them, CAP National Headquarters has undertaken the task of receiving applications and issuing "certificates of essentiality." Applications must be made out in quadruplicate and notarized by the applicant and local unit commander, and endorsed by the wing commander. They are then sent to CAP National Headquarters for approval and official certification.

Under present rules, those permitted to buy flight time to advance their skill for the war effort must be between eighteen and forty years of age and must meet physical requirements for a commercial certificate. Training must be for one of the following services: (1) CAP, (2) armed forces, (3) flight instruction in Army, Navy, CAA or Airlines Air Training Institute contract flying schools, (4) scheduled air carriers, or (5) pilot for aircraft or accessories manufacturers.

Airplane owners, by applying directly to the War Production Board, may obtain blanket permission to rent specified aircraft for flight instruction or tests to individuals who present certificates of essentiality signed by the national commander of the CAP.

Summer Program for Cadet Units Will Aid CAP Spirit and Progress

Now that school is out Civil Air Patrol squadrons are intensifying efforts to organize Cadet units for summer training. Some are being surprised by the effect of the youngsters' enthusiasm on the older CAP members, especially those whose interest has sagged.

"The psychological effect of seeing so many earnest, sincere and enthusiastic young people at CAP meetings tended to stimulate the regular members and open their eyes to how seriously others are taking CAP just now," says Capt. R. H. Jackson, commander of Wisconsin's Group 624. He referred to the record of the Madison squadron, which, within a few days had a Cadet unit under way with three times as many members as the squadron had.

The Minnesota Wing, which organized the first Cadet unit in the country, believes they are proving their value in numerous ways, and lists the following advantages which may be gained from Cadet units: (1) Cadet "graduates" attaining full membership keep senior squadrons supplied with members, (2) Cadets are valuable in other military services after training in CAP, (3) Cadets receive practical experience of value to aviation knowledge gained in classrooms, (4) Cadets use CAP as effective outlet for youthful patriotism, and (5) Cadets will find CAP training a convenient and valuable opportunity for utilizing their summer vacation.

MAJ. EARLE L. JOHNSON, NATIONAL CAP COMMANDER, is pictured above, third from the left, during an inspection he conducted of a CAP coastal patrol base in the southern region. Left to right are: Maj. Richard Jones, Louisiana Wing Commander; Lt. Arthur N. McAnnich of the Arkansas Wing; Major Johnson; Col. Harry Blee, operations officer of the National Headquarters, Washington, who accompanied Major Johnson; Major Byron Armstrong, commander of the coastal patrol base; Major Rex P. Hayes, Arkansas Wing Commander; and Lt. George Blocker, coastal patrol pilot.

Fire Bugs Bagged as CAP Spots 150 Fires in Big Texas Forest Region

By JACK FROST,
Texas Forest Service

Late in February a Civil Air Patrol plane sighted 145 fires burning in the vast East Texas piney woods forest area, and W. E. White, director of the Texas A. & M. College Forest Service, appealed to Governor Coke Stevenson for assistance in combating the menace to the strategically-important timber. After conferences with Commander D. Harold Byrd of the Texas Wing and Major George E. Haddaway, commander of a Gulf Coast CAP anti-submarine patrol base, the CAP began patrolling the forest from the air. In ten days time in March, the CAP flew almost 4,000 miles of patrol over two million acres of East Texas forest, reported on 150 fires and furnished information leading not only to preservation of thousands of acres of timber but to the apprehension of a number of fire bugs.

As a result, seventeen cases of incendiarism were taken up by officials. Out of them came three pleas of guilt. Three trials are pending. Eleven of the cases unfortunately involved insufficient evidence warranting indictment.

From the patrol also came other interesting facts. The average cost per mile of airplane patrol figured only 8 cents. The total cost of airplane mileage and pilot per diem was only $281.41. These figures, mind you, cover forty-two hours and thirty minutes of flying time and 3,500 miles of patrol over a ten-day period. During the first six days a 75-h.p. Rearwin model 175 was used, and the last four days a 90-h.p. Stinson Voyager made the patrol.

Lieutenant Gilbert A. Mapes, a CAP pilot, carried Texas Forest Service experts as observers and they were connected to lookout stations and other ground crews by radio. Mapes tells of one incident where an incendiarist was flushed from the timber almost immediately. "We saw three smokes coming up close to each other," he explained. "I flew to them and was able to report that they were intentionally set, and gave evidence leading investigators to the fire bug. Confronted with the report from the plane, he could do nothing but admit his guilt when approached by officers, who took him into custody immediately." In another example of effectiveness, Mapes reported a fire set in ten different places but the guilty person was apprehended.

Mapes usually flew at 2,000 feet. Smoke curling up from tree tops was easily seen. But it took close observation to catch the little fires which simmered beneath the foliage. When the air was filled with smoke from multiple fires, blocking off observation from 2,000 feet and from lookout towers, the pilot waded in and skimmed the tree tops. Sometimes the ground observers, in lookout towers directed the plane where to go, to determine whether fire fighting crews were needed here or there. This saved patrolmen many miles of unnecessary ground travel through the piney woods.

Courier Networks Encourage Unity Among Several Wings

Wings in Ohio, Wisconsin, Michigan and Indiana are developing and co-ordinating industrial courier service between their units. Major Garnet N. Hughes, national co-ordinating officer of the CAP, attended a recent meeting effecting the unitization. The entire Middle West may soon be unified in this manner as courier service is extended.

Statewide Roundup Staged by Oklahoma Wing at Tulsa

Lt. Col. Earle Johnson, national commander, and over 600 members of the state organization were expected to attend a mammoth one-day assembly of the Oklahoma Wing on May 29 in Tulsa. On the program were forums and discussions, review and inspections, graduation exercises and presentation of ratings and awards, drill competition, a glider exhibition, navigation competition and a dance.

Glider Pilots Welcomed into Civil Air Patrol

National Headquarters has urged CAP units to welcome the enlistment of pilots trained in the military glider program but who now lack opportunity to fly gliders. Many such pilots are being drafted into the foot army. But numerous others have inquired whether they could be of service in the CAP. "They will be welcomed as members of the Patrol, where it is hoped they can get enough additional experience for CAP active duty or for other branches of the war effort," a CAP statement said, adding the following:

"It is desirable also that local CAP units learn from these men as much as possible about gliders. In addition to potential combat uses, the experience of other countries has clearly demonstrated the utility of gliders for flight training on a mass scale. In America, the use of power planes has appeared the better way of doing it, but the number of available aircraft is being heavily curtailed by requisitioning for the War Training Service. In the areas where airports are shutting down under the present WTS and WPB policies, it may be desirable for CAP units to consider gliders. The civil airmen of this country will not stay on the ground."

Disney Creates Insignia for Los Angeles Group

Here and there across the nation, a few CAP units have called on their more artistic members to design a special insignia for their squadron or group.

Group 918 of Los Angeles went one step further by taking a grasshopper sketch originated by Lieutenants Ted Cate and John LoBuono and having that master insigna designer, Walt Disney, refine and animate it into this clever finished design.

The emblem has been colorfully reproduced on an embroidered patch which is now worn on the front of nearly every leather flying jacket in the Los Angeles group. It also appears on the group flag. "Semper Paratus," as you probably know, is Latin for "Always Prepared."

3rd Service Command of Army Schools CAP'ers in Military Tactics Course

A tactical school consisting of about forty-five classroom demonstrations and field problems and conducted by the Third Service Command of the U. S. Army at Fort George Meade, Md., has been attended by Pennsylvania Wing members. The week-long training is conducted in a strictly military manner, and each day begins at 6:00 a. m. with assignments lasting until 9:00 or 9:30 p. m. Many Army training films are used. Certificates are given those who graduate.

Texas Wing Developing Own Airport at Dallas

Through the generosity of Wing Commander D. Harold Byrd, the Texas Wing has acquired several hundred acres seven miles southeast of Dallas as its airport to serve the growing needs of the Civil Air Patrol. Management and operation will be in the hands of Wing Staff Officers, thus assuring CAP'ers fullest possible service. Captain R. L. Bowen and Captain Dion Johnson are carrying on negotiations with the CAA, CAB and the Army and Navy for the designation of the air base and for permission to make radio and lighting installations. It will be named "Byrd Field" as a tribute to Major Byrd.

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AIR NAVIGATION (Gold Medal Edition) includes meteorology, just published, $3.50.

METEOROLOGY: New edition for pilots by Lieut. Commander Halpine, $2.75 postpaid or C.O.D.

SIMPLIFIED CELESTIAL NAVIGATION by P. V. H. Weems and E. A. Link, Jr. $3.00 postpaid.

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Attention!

CAP MEMBERS

SOUTHERN FLIGHT's CAP Directives, formerly inserted in ALL copies of the magazine, are now included ONLY in the CIVIL AIR PATROL EDITION going to subscribers who are in the CAP.

It is possible that a number of SOUTHERN FLIGHT subscribers have not advised this office of their CAP membership. As a result they may receive the regular edition instead of the Civil Air Patrol edition. If this happens to YOU — and you want the CAP Directives — please notify us promptly and we will change your mailing accordingly.

PLEASE NOTE—The CAP edition differs from the regular magazine only in the insertion in it of the CAP Directives. All of the regular features appear in both editions.

SOUTHERN FLIGHT
Circulation Department
P. O. Box 750 Dallas, Texas

Takeoffs and Landings—Margaret Bowman, our "Cow Town" reporter, writes that the Municipal Airport was very "agog" over the celebration held there when the nation took note of the twenty-five years of scheduled air mail service. About 4,000 people came out and had a "look see" at the airliners which were converted into military transports for the duration. Some of the early airliners sat alongside of the nice four fan jobs of the modern sky freighters, and caused great "oh's" and "ah's".

Meacham is a very busy port, having American Airliners, Braniff "B" liners, Delta ships all jammed with passengers, mail and air express come in as regularly as a cow hand to town on pay day. The passenger traffic in '42 totaled 335,826 persons against 159,591 in '41 and a mere 5,446 in '31. This condition means that it will be as easy to order a ticket to Sidney, Australia, in '53 as it is to get a War Bond now.

From Alexandria, La.—Wood Breazeale sends in news of a red-hot fire. It took over a hangar in which nine planes were stored and destroyed the works. Insurance covered a part, but $6,000 worth of parts and tools went up in smoke. Wood is the Cub dealer in these parts and is rebuilding fast, can still get a job done for you and wants all his friends to continue to send him their business because he'll continue to get the job done, in the same ole Breazeale style. Hear?

★ ★ ★

Down Corpus Christi—Where AWOL means "A Wolf on the Loose", we can report that W. U. Paul assisted by "Wild Bill" Poole is running a very busy port. We flew down with Capt. R. G. McDaniel who is Group Commander of CAP, and took a reading.

The Navy makes landings and takeoffs every other minute and gives the local Fly Inn fits at coffee time. They are ably assisted by a lot of local men who claim to be "wolves" for some reason. After dark, we heard a few people order "Two Buds Over Lightly" . . . they got cokes, but it's a funny way to order.

Charlie Scholes came in from Houston with a pay load including Mr. David Frame who is the number one head up in Humble, and we hitchhiked a ride up to Big "D". In one hour and forty minutes the Lockheed had us home . . . ground to ground, that ain't walkin'.

★ ★ ★

In Dallas—We notice the offices around Love Field are full of service engineers, factory representatives, test pilots, CAA, WTS, and the Ferrying Command. The Command shook up the pan and sent some of their lads to some other places, military secrets. George Jalonick over at Southwest Airmotive, answered our phone query and we quote, "if you want an overhaul on your plane, phone, wire or write us and we will get you a special permit from the Ferrying Command to land at Love Field and take care of such details" . . . We unquote.

★ ★ ★

Marion Melcher reports from Kansas City, Missouri—At the monthly dinner meeting of the Kansas City Unit of the Women's National Aeronautical Association on May 12th Mr. Robert E. Whitmer, manager of Tariffs, Schedules and Research for TWA, discussed "Operation of an Airline." Program Chairman Mrs. Kenney Ellis, of the Aviation Department of the Chamber of Commerce, introduced the speaker. Mr. Lou Holland, the "grand-daddy" of aviation in the city, who has been in Washington for a number of months made an impromptu speech on being welcomed back to the city by the Unit and its friends . . . The Women's Chamber of Commerce had its annual Aviation Dinner on May 6th, with Major David Kratz of St. Louis as guest speaker . . . The Ninety-Niners invited members of the CAP and the Kansas City Unit WNAA to their dinner at which George T. Krebs, test pilot for North American, reviewed his experiences while flying over the Dark Continent doing transport service.

The silver anniversary of scheduled airmail service in the United States was observed in Kansas City by a luncheon at which Mayor Gage and Mayor Don C. McCombs of Kansas City, Kansas, Alexander W. Graham and A. H. Gillis, postmasters of the two Kansas Cities, spoke. E. Lee Talman, acted as host. . . . The first runway at Grandview airport has been paved—and a $90,000 passenger sta-

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tion is to be built at the new airport by the city . . . Maj. Albert J. Baumler, with fifteen enemy planes to his credit, and Lt. Col. Charles W. Kerwood, who flew with the famous Lafayette Escadrille in the first World War, were entertained by the Chamber of Commerce. Maj. Baumler, incidentally, contributed his blood at the Red Cross blood donor center. . . . The old LaGrone hangar at the Municipal Air Terminal was purchased by the city and in turn leased to Charles Toth, who operates an air school on the property.

★ ★ ★

Southern Flight—Two letters have been received offering Culvers for sale. If you're in the market, write to either L. J. Huddish, c/o The Allen School of Aeronautics, 1128 North Main Street, Providence, R. I., or Jack Nelson, Stamford School of Aviation, Stamford, Texas. They both sound like smart buys to us and we wish we had either one.

*** This is a new slant on your Ports of Call, and we would be very happy to have you write us and tell "all" on what's gettin' peeled at your field, so we can include it in the column. So drop us a note and give out . . . no holds barred.

Bye now.

TONY HAGMANN

BOOK REVIEWS

Before You Fly, *by Robinson, Middleton, Rawlins and Phillips, published by Henry Holt and Company, 257 Fourth Avenue, New York, price $2.75.*

This is a basic and simple introduction into the study of aeronautics, written for young people looking for careers in aviation.

Written by science and aeronautical teachers, well informed on the latest developments in aviation, and with a knowledge of the proper presentation for young people's study, it is a complete, clear and not too technical preflight course.

Air Navigation, *by Lt. Commander P. V. H. Weems, U.S.N. (Retired), published by McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y., price $4.50.*

Covering all the principal methods of air navigation—piloting, dead reckoning, position-finding by radio bearings and celestial observations—this book is designed to meet the needs of both seasoned pilots and aviation students.

Aviation Mechanics Simplified, *by H. L. Williams, published by A. Neil Sawyer Company, 275 Seventh Avenue, New York City, price $3.95.*

This 576-page book, which was in preparation for two years, is a complete study course in aviation mechanics. The volume was revised as it was written to include recent advances in both aviation mechanics and maintenance.

General Aviation Equipment Control Pulley Brochure

An 8½-page, two-color Brochure covering both the precision machined phenolic sheet pulleys and aluminum alloy pulleys with ball or roller bearings, has been issued by General Aviation Equipment Company, Inc., of Ashley and Wilkes-Barre, Pennsylvania, manufacturers of aircraft structural and control parts.

All pulleys are in accordance with specifications and have the approval of all branches of the military services. Full descriptions are given, and perspective and blueprint drawings are shown.

The Brochure is designed for use either in standard three-ring binders or in regular equipment files.

New Navigation Instruments by Jardur

Jardur Import Co., manufacturers of precision aviation accessories, has announced two new instruments of interest to air navigators.

The *Jardur Super Flightmaster* designed for the primary or advanced pilot, will solve accurately, quickly and easily every known air navigation problem without any mental arithmetic. A mechanical drawing board solution is instantly provided for the basic problems which assists in the visualization of each problem, maintaining all data on the face of the instrument until the solution is reached, thus avoiding any errors.

Constructed from heavy, durable Vinylite, the "Flightmaster" is supplied in a leather case with complete instruction book.

The *Jardur Flight Plotter*, designed by Lieut. Ernest G. Vetter, USNR., is an accurate, versatile, pocket-size instrument for determining true course or track, measuring distances and working wind triangles or triangles of velocity problems and reciprocals. Some of its advantages are: large easy-to-read numbers and two-color scales and durable, non-inflammable Cellulose Acetate material.

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